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THE competition between the Colorado "mountain and valley" smelters is growing more severe, and those in the vicinity of Leadville are one by one ceasing to purchase new supplies of ore. They urge that the present freight on base bullion to Denver, $12 per ton, is too high, compared with the low charges on ore, $5 per ton. The advantages possessed by the works at Pueblo and Denver in the way of cheaper labor and cheaper fuel seem to make the transfer of the bulk of the business to the valley works only a question of time.

THE protracted dullness in pig-iron, at a season which should be one of the busiest of the year, has culminated in an open cut in prices. Our weekly market reports have closely reflected the growing disappointment felt by the trade during the month of September, which no attempts at glossing over could hide. As usual, the managers of the Thomas Iron Company have taken the lead. In the past, their course has been the butt of sharp criticism by other makers, who were doing quietly what Mr. B. G. CLARKE was doing openly. The experience during the past year has proved the wisdom of this course, and the trade now generally acknowledges it. The temptation is great on the part to furnace-men to pile up iron, in order to avoid the cost of blowing out, and the future expenditure ofblowing in again. This protracts the period of depression and makes a crisis, when it does come, all the more disastrous. Prompt reductions, openly made, give confidence to the buyer and precipitate a remedy by forcing the weaker producers to stop.

A VERY serious accident occurred during the meeting of the Iron and Steel Institute at Middlesborough, which painfully illustrates the danger incident to the visit of a large number of persons to industrial establishments. A number of members of the Institute visited the Northeastern Steel-Works before the time appointed for their reception. When on the platform, on a level with the cupola top, one of the ladle-buggies filled with molten metal stuck fast as it was pushed by a locomotive. The engineer backed up and tried to force the buggy over the obstruction by running against it. The shock broke the clutch, and the ladder began to swing around, slowly emptying its contents on the platform in the direction in which the visitors and a number of men were standing. All of them were covered with a spray of molten metal, a number were more or less injured, and one gentleman, Mr. SAMUEL DAVISON, of the Horbury Bridge Iron-Works, near Wakefield, was so seriously burnt that he expired a few hours afterward. While none of the visitors was directly responsible for the accident, their presence possibly might have had something to do with it indirectly. It is certain that, in a mill, the visit by a large number of strangers increases the danger of accidents. Often, unconsciously and unintentionally, they stand in the way of the men, whose attention is only too often diverted from their work, and who frequently take extra risks in order to make a special show of activity. We have repeatedly observed instances, too, where the visitors unconsciously, placed themselves in positions of danger. The gentlemen who act as guides to their visitors can not watch personally over the safety of all, especially as there are generally, in every party of the kind, a number of persons who prefer to ramble off by themselves.

THE UTILIZATION OF THE WASTE PRODUCTS IN COKING.

Probably no subject affecting alike the coal and iron interests has deservedly attracted so much attention as the utilization of the waste products in coking. The developments during the current year have advanced the question far beyond the preliminary stage when the principal amount of work done is to compile appalling figures of the loss to nations by the failure or neglect of their coke-makers to gather the oil, tar, and ammonia escaping in the gases issuing from their ovens. It is now generally admitted that "there is something in it," and all efforts are now directed to ascertaining how much. When, some time since, we presented to our readers the leading designs now before the technical public, we repeatedly had occasion to remark how comparatively meager were the actual figures of results obtained on a working scale, and how striking was the absence of trustworthy testimony on some vital points. The accumulation of experience on such a subject is, of course, slow, but the facts brought out at the Middlesborough meeting of the Iron and Steel Institute prove that those engaged in working out this important subject can not be accused of inactivity. Two papers were read before the society, one by Mr. ROBERT DIXON, of Peases's West, Darlington, on the Simon-Carvès ovens, and a second by Mr. J. JAMESON, of Newcastle-upon-Tyne, on his plan. Both gave the results of actual working and both were subjected to a close criticism, in a long and animated discussion, in which many points of interest were brought out. Together, papers and discussion would fill an entire issue of the ENGINEERING AND MINING JOURNAL, and we must therefore content ourselves with a summary of the evidence presented.

Turning first to the working results of the Simon-Carvès system at Peases's West, with a coke plant of 25 ovens, Mr. DIXON reports that in 215 working days they coked 7042 tons of coal, produced 5424 tons of coke, a yield of 77·03 per cent, and furnished 43,164 gallons of tar and 195,076 gallons of ammoniacal liquor, or 6·12 gallons of tar and 27·70 gallons of liquor, from 6 to 7 degrees Twaddell, per ton of coal. Against a claimed increase of 15 per cent in the yield of coke over bee-hive ovens and the value of the by-products, stands an extra cost for labor, inclusive of that of collecting the latter, of 1s. 3·31d. per ton of coke, the total cost being 2s. 3·96d. per ton. The average value of the tar and the ammoniacal liquor is placed at 3d. and 1d., respectively, per ton, making the returns from this source £1351.

The Jameson system has been only used on an experimental scale apparently, at Bell Brothers Page Bank colliery at Fellwig, and at the Weardah Iron and Coal Company's colliery at Tudhoe Grange. It will be remembered that it is merely a modification of the ordinary bee-hive oven. The most efficient plant is that at Fellwig, where the coal that yielded at its best 5·12 gallons of oil and 1 pound of ammonia per ton of coke gave on an average 5·63 gallons of oil and 3·16 pounds of ammonia, the yield of coke being 67·5 and 68·5 per cent in both cases, in excess of the returns from ovens before being converted into the Jameson type.

Mr. JAMESON estimates the profits from a plant of 100 ovens, coking 1100 tons of coal per week, and yielding 5 gallons of oil per ton at 2½d., and 3 pounds of sulphate of ammonia, valued at 13s. per cwt., at £3536 per annum, on an outlay for the conversion of 100 ovens of £1750. It will be noticed that while, in the former system, the aim is to make tar, the object of those working the latter is to produce oils.

The Simon-Carvès ovens labor under the disadvantage of being more costly, the actual outlay for the first battery of twenty-five being £226 per oven, which would probably be reduced to £180 in building a set of 100 ovens. The capital required for putting up twenty-five 11-foot ordinary bee-hive ovens is stated to be £58 per oven, while the cost of converting the latter into Jameson ovens is given as from £17 to £18 per oven. Other things being equal, the Jameson oven, or the earlier Aitken oven, differing from it only in certain details, would have by far the advantage. So far as the values of the by-products are concerned, they are not directly comparable, because of the difference in the character of one of them and the absence of a definite statement in the case of the Simon-Carvès oven concerning the amount of ammonia in the liquor.

Turning to the experience had in working the different ovens, it is reported that, in the Simon-Carvès system, there in the danger of pitch collecting in the gas mains, which Mr. DIXON claims to have overcome. It is proposed to heat the air for burning the gas for coking in a "recuperator," fired with the waste gas after the extraction of the liquid by-products. This system, by increasing the temperature of coking, will, it is argued, make the yield of coke larger still, and reduce the time of coking from 72 to 48 hours. It is now in use at Bessèges, at the coke-works of the Terre Noire Company. It was found, too, that the form of the floor of the Simon-Carvès oven was not adapted to Durham coal, and a new plant at the Peases's West works will be modified in this respect.

The Jameson system has also had its troubles, some of which appear to be inherent in the design. Mr. JAMESON extracts the gases from the distillation of the coal by applying suction at the bottom of the charge. He himself says:

"It is clearly possible by excessive suction to diminish the yield of coke by driving air through the charge and so burning it; and it is as clearly possible by too slight suction to make a recovery of products of almost no value; but the range between these limits is very wide, and by due proportioning of the suction in reference to the circumstances of the case, it is possible to effect a large recovery of oil and ammonia, with a full yield of coke of the highest quality. In this regulation of suction lies the whole secret of the success of the process; and doubtless, to insufficient attention to this point are due in large measure the varying results which have occasionally been obtained.

"Sometimes differences in yield of products are observed with the same coal in different ovens, and sometimes even with the same coal in the same oven; and it may be regarded as the one essential requisite to obtain the best results, that the process be conducted (in regard to the amount of suction) alike in accordance with the quantity of coal treated, the peculiar character of the coal, the progress of ignition, the shape of the oven, the amount of chimney draught pulling in the opposite direction when the oven is more or less closed, and perhaps other circumstances as well.

"The necessity for the observance of the conditions last named will be apparent at a glance. In regard to the quantity of coal contained in the oven, and its depth and the progress of ignition, it is manifest that under various and varying circumstances a mass of closely packed coal is interposed between the measured suction in the oven bottom and the stratum of coal in which the gas is forming, and that, to produce an equal suction at this point, the applied suction outside should vary in the ratio of the resistance of the interposed mass of coal. The character of the coal and its condition, whether ground or otherwise, also of course affects this, and the chimney draught is of much importance. In regard to the latter, there can be no doubt that at the early stages of the coking operation, while there is access of air over the charge, the actual suction due to the chimney is diminished by that access of air; but when the oven is nearly or entirely closed, the pull of the chimney is thereby increased, and therefore increased suction externally is required to produce an equal effect. With a single oven, worked by a blower of its own, it is of course easy to regulate the suction as may be desired; but with a range of ovens exhausted through one main pipe, it has not been found easy. In order to avoid suction much in excess of the requirements in some ovens in a range, it has been usual to fix the suction for the whole range at much less than would be advantageous for other ovens, and to work at a mean, which thus sacrifices efficiency in two ways. Another disadvantage to the process has arisen from the fact that, even if the speed of the blower be kept uniform (which is not always practicable), the shutting off more or less of any ovens connected with it, which may have become coked throughout, causes a variation in the pull by the blower, and the coke-maker, with this in view, usually errs upon the side of too little suction. To obviate the difficulty stated, it was proposed to work ranges of ovens with several main pipes exhausted to different degrees, and to one or other of which each oven could be connected in turn through a sluice-valve, so as to give different suction at stated times during the progress of the coking; but the increased expense involved has prevented the application of this plan. By a recent improvement, however, the suction of the blower has been made uniform automatically, independently (within limits) both of the speed of revolution and the number of ovens connected to it; and with a single range of pipes, the suction to each oven can now be varied and adjusted as efficiently and as simply as if several ranges of pipes were used."

It appears, from remarks made by Mr. JAMESON during the discussion, that this improvement consists merely in providing the suction pipes of every oven with valves, the suction being diminished gradually as the process of coking continued toward its end.

The evidence is conflicting on the principal point, so far as American coke-makers and iron-masters are concerned, the question whether the quality of the coke made in ovens from which the products of distillation are gathered suffers. As to the increase in the yield claimed by the Simon-Carvès oven, as by all ovens of the Belgian type, there is some doubt, as the amount of water in the coke was not given, though stated to be about the same as in the coal from which it had been made. The coke from the Simon-Carvès ovens is conceded to be dense and heavy, without the strong luster of the product of the ordinary bee-hive. Experience in this country, at least so far as it refers to the Connellsville coal, is against the Belgian oven, so far as iron smelting is concerned. There seems little doubt that this inferiority, which is certainly not imaginary, depends entirely upon the structure of the coke. Mr. G. E. STEAD, of Middlesborough, the well-known metallurgical chemist, stated, in the discussion following the papers, that he had tested chemically, the coke made in the bee-hive and in the Simon-Carvès ovens, to see whether there was not a greater proportion of volatile hydrocarbons left in the coke from the latter. He reports that the difference was extremely small, being about one per cent in the latter to from one half to three quarters of one per cent in the former. From a chemical point of view, he therefore declared them practically the same. The burden of proof lies with the makers of the denser fuel. If they can show that, other things being equal, the dense fuel will do as good work in the blast-furnace as the standard product of the bee-hive, the Simon-Carvès and other ovens of that type will receive recognition in the great Durham District in England, as well as in the Connellsville region in this country. Mr. THOMPSON, the manager of Bell Brothers, Clarence Works, spoke in the most emphatic way against it. He stated that he had used 300 tons of the Simon-Carvès coke, and although he started by reducing his burden by 5 per cent, the grade went down to Forge 4, and he came to the conclusion that, if they had gone on another week with the same fuel, there would have been a difference of 12 per cent to get the same quality of pig which they were producing before using it. The maker of the coke, Mr. DAVID DALE, on the other hand, explained that the fuel used during the experiment at the Clarence Works had been exposed to snow and sleet for a long time, and that it was therefore exceptionally wet. At the works of the president of the Institute, Mr. B. SAMUELSON, the new coke did as well as bee-hive coke.

The coke from the Jameson oven is generally conceded to be the same in appearance, and in the furnace it proved to work as well as ordinary bee-hive coke. Thus far, we can not escape the conclusion that the Simon-Carvès oven labors under the disadvantage of producing a fuel that is not as well adapted to the blast-furnace process, ton for ton, as the bee-hive coke. Whether the increased yield, due allowance being made for any larger quantity of water in it, will fully or more than compensate for any decrease of efficiency due to its structure, remains to be seen. It is certain that the Jameson and Aitken systems, with their slight outlay for alterations of existing plant, and with the absence of any appreciably injurious effect upon the quality of the fuel, will be more attractive to American coke producers and more acceptable to our iron-masters.

Here it may be well to call the attention of English metallurgists to a paper read by Mr. F. P. DEWEY, of Washington, before the American Institute of Mining Engineers, in which he gives his methods for determining the porosity and specific gravity of coke, and the results of a series of tests on cokes from Connellsville, West Virginia, Tennessee, Colorado, and Ohio.

CORRESPONDENCE.

[Communications will be noticed only when accompanied with the full name and address of the writer. Unless specially desired, only initials will be printed. We invite criticism and comment by the readers of the ENGINEERING AND MINING JOURNAL. Replies not intended for publication should be addressed to the Editor of the ENGINEERING AND MINING JOURNAL in blank, stamped, and sealed envelopes. We do not hold ourselves responsible for the opinions of our correspondents.]

The Debris Controversy Boiled Down.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Woodruff *vs.* North Bloomfield Mining Company *et al.* is the title of a case pending in the Circuit Court of the United States for this State, which involves the right to mine by any method, although the defendants are sued as hydraulic miners. As it affects the prosperity of thousands of people and the value of many million dollars' worth of property, I shall endeavor to present impartially both sides of the controversy, and for convenience will suppose both parties presenting their case.

Plaintiff (representing the owners of lands and town lots near the valley-rivers): You are pursuing an unlawful occupation, whereby you have covered with mining *débris* thousands of acres of productive lands, and threaten destruction and damage to other lands, and to structures erected in towns, the safety of which is imperiled by your operations. You are filling the navigable streams of the Sacramento Valley with sediment, impeding navigation and causing us great expense in the erection and maintenance of levees for protection from the floods which result from the filling of the rivers during periods of high water; and you are injuring the bay of San Francisco. The continuance of your operations will be detrimental to the best interests of the people of the State, and fatal to the prosperity of hundreds of farmers owning lands near the valley-rivers. Your business is a public nuisance, and we ask that you be perpetually enjoined from the further use of water as an agency in removing dirt, and from the sale of water to others for such a purpose.

Defendant (representing the mining interest): We are engaged in a legitimate and lawful business, sanctioned by special laws of the United States, and by custom and usage for more than thirty years, whereby we have acquired an easement and prescriptive right. We have purchased our lands from the United States government as mineral lands, and paid for them double the price of agricultural lands, with the full knowledge on the part of the government of the method to be pursued in extracting the gold, as is apparent by the inspection of the heading and vignettes of United States mineral patents, representing hydraulic mining as at pres-

ent prosecuted. Confiding in the validity of our title and easement or franchise, we have expended many millions of dollars in driving long tunnels to tap our auriferous deposits, and in building reservoirs and digging canals to convey water to our mineral lands. In the prosecution of these works, populous communities have grown up; and thousands are dependent upon our industry. We have added to the metallic wealth of the world nearly 1200 millions of dollars, and, if undisturbed, will continue to add thereto at the average rate of $18,000,000 per annum for an indefinite period, estimated at not less than one hundred years. Gold is the great lubricator of commerce. In the present age of progress, it purchases all necessaries; and the nation which produces it can want for nothing. Our country is the great storehouse of gold; our auriferous ancient rivers are the only known large deposits of the metal, and these mines are the only available source of large production. The equities of our tenure of lands and public policy alike forbid suppression of our business. The breaking down of dirt by projected water is an incident of our business, without which it can not be pursued. The mountain cañons are the natural receptacle of the material washed from the mines. In them, the heavier or coarser matter becomes impacted near the mines, the lighter going gradually downward, but susceptible of being restrained by dams. You have endangered your towns in periods of high water by a defective and unscientific system of levees, and you have obstructed the efforts of the government to protect the navigable rivers by measures recommended by government engineers. The bay or harbor of San Francisco has in no manner been affected by our operations. We ask that your bill be dismissed.

The above is substantially the case to be presented to the Circuit Court of the United States, and thence appealed to the Supreme Court; for it is admitted that the losing party will carry the case to the final court. The taking of the testimony had been in progress on September 1st more than ninety days, during which some 210 witnesses had been examined. The testimony so far covers more than 20,000 pages of two hundred and fifty words each. JUSTITIA.

SAN FRANCISCO, Sept. 20.

REMARKS ABOUT LEAD-SILVER BULLION SMELTING IN THE WEST.

Written for the Engineering and Mining Journal by Carl Henrich.

The object of lead-silver bullion smelting in the West is the extraction of lead and silver combined from the argentiferous lead and dry ores. The lead takes the same *rôle* in smelting which the mercury takes in the amalgamation or "stamp-mill" process, only that the lead is generally not used in its metallic state, but in the form of its various ores. Sometimes metallic lead in the form of base bullion has been used, when lead ores were scarce; but doing this has proved faulty, a large loss of lead and silver being the invariable result. Lead-silver smelting consists in the proper mixing of the different argentiferous lead and dry ores, the addition of the necessary fluxes, and the smelting of all this in the proper furnaces with the proper fuel.

There may be some hearths or reverberatories in the West for lead-silver smelting. If there are, I do not know of them, and can not say any thing about them. I shall restrict my remarks to the smelting in blast-furnaces, and shall consider the best smelting mixture to be made under different conditions, the best style of furnace adapted to the smelting of the charges, the quantity and quality of the fuel to be used, the best and most serviceable fluxes, the blast-pressure and amount of blast employed for the different fuels and furnaces, the impurities of the ores and their treatment, and the flue-dust and its treatment.

In making these remarks, I shall simply give the results of my experience and experiments in smelting, together with some conclusions I have arrived at, but without going too much into details. I shall not advance any theories, except those which I have actually tested and found to work correctly in practice.

In making a charge, that is, the right mixture of ore and flux, we want a certain per cent of lead as a minimum in the charge. With pure ores, containing no zinc, arsenic, or antimony, we may go as low as 8 per cent of lead in the charge; while with ores containing the above impurities in appreciable quantities, the percentage of lead in the charge should not be less than 14 per cent. Then, if not absolutely forced to do so, we should not make a higher grade bullion than one containing one per cent silver, or about 300 ounces to the ton. Higher grade bullion will lead to larger losses of silver, while, with not over half of one per cent silver, or 145 ounces to the ton, in the resulting bullion, the results in good smelting will agree very closely with the assay results of the ores, and with good and pure ores will even surpass the assay results of the ore a trifle. With these considerations, it remains for us to find a mixture of these different ores which will require as little flux as possible, a mixture which will flux itself, if possible. It has been the general custom of metallurgists in the West to find some slag which would work well in their furnace, and to adjust the mixture of the ores and fluxes to the requirements of this slag. This method is a very convenient one, and will, as a rule, give good results so far as making a slag free from lead and silver is concerned. Whether this method is always conducive to the best or even to good financial results, is another and altogether different question.

Slags are silicates, and it is unnecessary here to explain the difference and the characteristics of sub-silicates, singulo-silicates, and bisilicates. It is sufficient to point out the fact that singulo-silicates contain twice as much, and bisilicates four times as much silica to the same amount of bases as the sub-silicates. It is claimed almost universally that a singulo-silicate as slag is an essential factor in good lead smelting. And it has further been claimed that, of all singulo-silicates, that one will be the best in which the ratio of ferrous oxide (FeO) to calcic oxide (CaO) is approximatively as 2 : 1, or as

$$6FeO : 4CaO.$$

In smelting pure ores, containing no undesirable ingredients, such as arsenic, antimony, or zinc, there is no doubt that such a slag will give splendid metallurgical results, especially if the precaution is observed to keep the percentage of silica a little higher than the bases would strictly need to form a singulo-silicate. This slag is easily fusible, requires little fuel and blast, and, with good ores, will keep the furnace open. But from an economical stand-point, it is, even with good ores, not always desirable to make this slag. In case we have to deal, as is frequently the case, with very siliceous ores and siliceous iron and lime fluxes, an attempt to make this slag would often result in using a disproportionate amount of flux, in lowering the lead contents of the charge below the desirable minimum, and in making smelting an altogether unprofitable business.

Now the question arises: Is it necessary in lead smelting to make a singulo-silicate slag? I answer No; we can obtain just as good metallurgical results and just as clean slags by making higher siliceous slags—slags forming mixtures of singulo and bisilicates, or being even true bi-silicates, if we only construct the right furnaces to do it in, use the proper fuel and blast, and do not attempt to make a bisilicate slag in furnaces constructed for the formation of a singulo-silicate slag. Bisilicate slags, or slags which are a mixture of bisilicate and singulo-silicate, demand a higher furnace and a higher temperature in the smelting zone of the furnace, without necessarily requiring a larger amount of fuel. The making of such higher grade silicate enables us to smelt profitably ore mixtures which we should be totally unable to smelt if we attempted to make singulo-silicate slag.

The temperature at which a slag forms or smelts will be the approximate temperature of the smelting zone of the furnace in which the slag is made. This is obvious. No matter how high a temperature we might be able to get by using a certain kind of fuel and pressure of blast, as soon as the temperature rises to the point at which the slag is formed, this slag will run down in liquid form in the space of the furnace (from 11 to 13 inches high) between the lead-bath of the crucible and the tuyeres, and colder yet unmolten material will take its place. No matter, as a rule, whether other products of a furnace, like matte, speiss, even metallic iron, have different formation or smelting temperatures, their temperatures will very soon be either raised or lowered to the neighborhood of the temperature of the liquid slag, because the slag forms as a rule by far the larger bulk of the molten products of the furnace. The temperature at which a slag first forms, I have no doubt, is higher than the temperature at which the already formed slag will be remelted.

This fact that the formation temperature of the slag is also the approximate temperature of the furnace, above which temperature no increase in the fuel or blast-pressure will be able to raise it, has not received enough consideration in ore smelting. Most speisses, for instance, require for their fusion a higher temperature than that of the commonly made singulo-silicate slags. "Hinc illæ lacrimæ"—therefore these speiss-sows.

Unfortunately, we have very few reliable statements of the different temperatures necessary to the formation and melting of the different silicates and other furnace products. But we do know that higher slags containing percentages of silica, as a rule, are hotter than the singulo-silicate slags. It will be desirable and advisable on this account to make a higher silicate, when we have to deal with an ore-forming speiss.

What kind of slag to make will depend on local circumstances and on calculations and experiments in each separate case. It will be a severe test and show the ability of the metallurgist, to make the right slag in the right place, and not try to make one so-called standard slag do the work in all cases, and say where this slag will not work lead smelting will be a failure. If the furnaces commonly built at present will not do for the slag which he will have to make, then, to achieve success, the metallurgist ought to be able to design and build a furnace which will do the work. One great factor of success in smelting is, to use as little flux with the ores as possible. This will also reduce the cost of fuel necessary for smelting the same amount of ore. It generally costs more to smelt a ton of flux than it costs to smelt a ton of ore.

The form of the blast-furnace used in lead-silver smelting ought to depend upon the quantity of ore to be treated and upon the nature of the most desirable and profitable slag to be made. For smelting small quantities of ore, the circular water-jacket furnace of not over 36 inches diameter will be the most convenient, and as good as any. A furnace designed for more siliceous ores and slag might have a diameter of 42 inches; but even with 2½-inch mercury pressure of blast, I should not advise any further increase in diameter, as the blast will then not reach the center of the furnace in a sufficiently effective manner. Furnaces for larger consumption of ore ought to be made oblong, with the tuyeres at the long sides, and of a width of from 32 to 36 inches at the tuyeres. I should prefer 32 inches for furnaces not over 11 feet high above the tuyeres. The length varies with the amount of ore to be put through a furnace. The amount of charge smelted with 2-inch blast pressure, coke, and ten 3-inch tuyeres will constitute as much as a single set of furnace hands will be able to handle with twelve-hour shifts. The hight of the furnace is determined by the rule to keep the mouth of the furnace cool. Therefore, if we smelt with a higher blast pressure, we want to increase the hight of the furnace, else we shall get the mouth of the furnace blazing; and this will lead to a great loss in lead and silver by volatilization, which forms the kind of flue-dust hardest to condense.

More siliceous slags will require a higher furnace. The general hight at present is from 10 to 12 feet from the tuyeres to the feed-door. For siliceous ores, the hight ought to range from 14 to 18 and 20 feet. Every blast-furnace ought to be provided with a proper dust-chamber, or at least with a flue leading to a common chamber, where many furnaces are used. According to the experiments made at Ems, and described by Professor Egleston, as much surface as possible ought to be given in these dust-chambers, which may be done in a comparatively limited space by hanging in numerous sheets of iron in a vertical position.

The best fuel, and almost the only one fit to use in the West, is coke. Charcoal made from the local light woods, as pine, aspen, or cottonwood, is hardly worth putting into the furnace, and is doubtless put into many furnaces more from old prejudice than for any real benefit which the furnace derives from it. The piñon charcoal is good, if it can be got burnt thoroughly, which generally is not the case, a large amount of bitumen being kept back in it. Mesquite wood makes a splendid charcoal, but is hard to get in large enough pieces. Fine charcoal is not worth any thing for smelting, and it is of more benefit to the furnace to keep it out than to put it in. It will be found best generally to smelt with coke alone, using only very little, and only good charcoal as a sprinkling along the walls of the furnace. Good fuel ought to carry from 7 to 9 times its weight of charge. At least, I have found no difficulty in smelting with this amount of fuel even very refractory ores. This would

be from 11 to 14 per cent of fuel. Fourteen per cent of good fuel, like coke (Trinidad or El Moro with 22 per cent ash), ought to be enough for any charge, after deducting the lead contained in the charge from the weight of it. For instance, if we have a charge of 1200 pounds with 150 pounds lead contained therein: $(1200 - 150) \times \cdot 14 = 147$ pounds of good fuel = 130 pounds coke and 17 pounds good charcoal, which ought to be sufficient for smelting that charge. Where good charcoal as described above (piñon or mesquite) can not be got, it will be best to use coke alone. Of course, there may be places where neither good charcoal nor coke can be had. The best thing to do in such an emergency will be to try quite low and small furnaces, in which the weight will not be very heavy on the soft coal. It will be at least a very unsatisfactory and primitive smelting, and the waste products will afterward form the basis of renewed metallurgical treatment.

The blast will vary according to the kind of fuel used and the hight of the furnace, and it will be a safe rule to give as much blast as possible without getting the top or mouth of the furnace in a blaze. The blast generally used at present varies from half an inch to 1½ inches mercury.

The impurities most frequently met with in the ores are zinc, arsenic, and antimony. About the proper treatment of zinciferous lead ores, I have almost nothing to say. I have never had any trouble on account of the zinc, but I have never smelted charges with more than 5 per cent of zinc in the charge. I smelted such charges with coke alone, and with a slag between a singulo and bisilicate, the ratio of oxygen being as 4 : 3 and 3 : 2. The only difficulty which showed itself was a rapidly growing accretion at the upper walls of the furnace, diminishing seriously the clear section for the passage of the charges. At first, I thought this accretion to consist mainly of zinc oxide and sulphide, but I found it afterward to be nearly pure artificial galena, with only about 2 per cent of zinc. But I always noticed a faster growth of these accretions during the presence of zinc ore in the furnace. The slag only contained traces of zinc, and most of the zinc doubtless went up the chimney, as the bluish-white zinc color of the smoke showed. With the zinc went also considerable silver.

Arsenic and antimony in the ore will go partially into the bullion, to which they give a very white and clean appearance, easily recognized. But the largest part of the arsenic and the antimony combine with iron and form speiss varying in composition. I always allow one and a half parts of iron to one part of arsenic, which would correspond to Fe_4As. I do not find any difficulty in keeping the furnace clear of speiss-sows, by simply maintaining a hot temperature in the furnace, which can only be done by making a slag which requires for its formation a higher heat.

Formerly in Leadville, I endeavored, like most other smelters, to make a singulo-silicate slag, and with this slag, as soon as I got arsenious ores, I was sure to get a speiss-crust in the furnace. This crust, however thin at first, cooled the lead in the crucible, as it kept it from contact with the hot slag, and the speiss-crust grew gradually thicker, until it grew into a formidable sow and necessitated the blowing out of the furnace.

Acting on the prescription of metallurgical hand-books, that the speisses of the composition Fe_4As, Fe_5As, Fe_7As, etc., were more easily fusible than those containing less iron, I applied, like others, metallic iron, especially old castings, as a remedy. The iron melted down well, but I never succeeded in removing a speiss-crust by these means, and I have yet to learn of the first speiss-sow removed in that way. I have for this reason grown skeptical in regard to the easier fusing of these more ferrugineous speisses. The only safe way to deal with speisses in the blast-furnace, according to my experience, is to keep the furnace hotter than a singulo silicate slag will make it. As speisses carry away considerable silver and gold, it will be prudent to make as little speiss as possible, that is, to use for one part of arsenic as little iron as possible. The speiss Fe_4As will be found to work very well with a slag of the oxygen ratios 4 : 3 or 3 : 2, the latter if there is a large amount of speiss forming in the furnace.

It has been almost everywhere the custom to mix the flue-dust with burnt lime and water to a kind of mortar. This was left to harden in the air, either in heaps or in the form of bricks. This is a very unsatisfactory proceeding, as, when put in the furnace, this mass almost immediately crumbles to a fine powder, only to be, to a large percentage, converted again into flue-dust and part of it probably blown out through the chimney. As this flue-dust contains a large amount of fine coal and bitumen, and as, besides this coal, there will be found in it a large amount of arsenic, antimony, zinc, and other undesirable volatile substances, it might be a good plan to burn a large pile of it over, and possibly thereby sinter the dust together, besides getting rid of some undesirable elements in it. If burning over will not sinter the dust enough to use it in the furnace, it ought to be slagged in a reverberatory furnace, either by itself, or together, with some suitable flux (powdered lead-slag, for instance), before it is put into the furnace again.

A proper regard to all these different considerations is necessary to a successful smelting of lead-silver bullion in the West. The one factor, however, on which financial success mainly depends is to smelt any different given ore mixture with as small a quantity of flux as possible. Doing this, we shall lower the cost of treatment of the ores; for by diminishing the flux used, we shall increase the ore used at the same time. In this way, we shall expend less labor, less flux, and less fuel—the three main items of expense—on each single ton of ore. But we can only use a minimum of flux, if, instead of adjusting our smelting mixture to our slag, as is mostly done now, we adjust the slag we want to make to the requirements of the ore mixture which we have to smelt. To show that we are able to do this was the object of the above remarks. It may be more convenient to follow the first method. It will be surely more profitable, and also metallurgically more correct, to follow the second method.

DENVER, COLO., Sept. 11.

IRON WATCHES.—Messrs. Crowther Brothers & Co., of Kidderminster, in order to prove the malleability and ductility of their iron, have constructed a watch entirely of iron, which keeps excellent time. Claudius Saunier, on reporting this fact in the *Revue Chronométrique*, adds: There is nothing new under the sun. We have a watch upon which is engraved the date of 1504, and in which all the wheels and pinions are made of iron.

A LETTER FROM MEXICO—EL PASO.

Special Correspondence of the Engineering and Mining Journal.

The seeker after mines in Mexico, if he does not always find what he is looking for, is at any rate rewarded by a taste of travel so altogether novel that he suffers less disappointment than he does when returning with an empty game-bag from a fruitless hunt in our own West. The railroads now building will soon put the principal cities north of the capital within rapid reach of one another; but even when they are completed, saddle-horses and pack-train will still be indispensable to reach most off-lying localities. The two principal cities in North Central Mexico are Chihuahua and Durango, capitals of adjacent States; and yet there is no public vehicle plying between them. The Central Railroad will next year supply a passage, but meanwhile a composite mode of conveyance must be resorted to by rail to Jimenes, by coach to Parral, and by private ambulance or horseback to destination, unless a conveyance can be found in Jimenes for Durango directly. Such being the absence of facilities now between two such important centers, it is certain that for many a day, even after the impulse of railroads has been felt, conveyance by quadruped will still be the only one available.

Some hints therefore on the subject of travel may not be amiss. When a journey can be completed by coach, by all means take the coach. It is not more uncomfortable than the average Concord coach, which at best is designed, one would think, by builders who had never seen a human being, so utterly unconformable are all the curves to the curves of our bodies. The clumsy vehicle is drawn by a cavalcade of horses, mules, or donkeys, strung together by dilapidated harness, itself being hung together by raw-hide. The stages are unconscionably long, being from 30 to 60 miles; yet these unfortunate little rats reach the end of their journey by dint of blows, stones, and perpetual haranguing on the part of driver and whipper-up, aided, likewise, by a peculiar but very efficacious plan of shuffling the whole team when it becomes very tired, and turning it out to graze when it becomes hopelessly exhausted. A stage journey begins but does not always end on schedule time. It, however, is well for the traveler and prospective miner to learn at the outset that our maxim about never putting off till to-morrow what can be done to-day, is reversed in Mexican practice, and that nothing is ever done to-day which can, on any plea, be deferred till to-morrow, or, better still, the day after. But, as I have already hinted, stage routes are few, and you have generally to provide conveyance for yourself. If there be a carriage-road to your destination, you may be able to hire an ambulance; but if your journey is to be long, it is better to buy a vehicle and mules, and trust to selling your outfit at your journey's end. For instance, if going from Parral to Durango, you are advised by printed placards in Chihuahua and elsewhere that Ruperto Enriquez runs what the pictures at the head lead you to suppose are coaches from and to all principal points. But the most inquisitive inquiry failed to ascertain even where Enriquez's headquarters were—a fact the posters omitted to mention. Both in Parral and Jimenes, after wearisome delay, a wagon can be hired to deliver you in Durango, 200 miles due south, but nearly 300 miles following the road by way of Mapimi, for about $100 and in about ten days' time. If returning at once, no charge will be made for carrying you back to Parral. Many important points, even outside of the Sierra Madre, can, however, be reached by trail only. The equipments for a horseback journey should be purchased in the nearest large city to destination, even when a coach-road permits of the use of a conveyance for part of the journey; for though Mexico is the home of horses, mules, and donkeys, the chances are many to one against your being able to buy or borrow an animal of any kind in a small mining town or at a *hacienda*. And in making your time calculations, allow a wide margin for loss while negotiating for the purchase of horses and equipments. First you must find a *mosso*, and if he succeed in finding *one* horse a day, he does well; and while doing that, his limited power of combination probably prevents his finding saddles, pack-saddles, saddle-cloths, etc.; therefore more days pass in collecting these. Then the horses have to be shod and provisions collected, all which eats up more time and more money; for the Mexican, once engaged, keeps strict count of his wages.

The subject of provisioning is there and everywhere one of moment. Even if journeying through a settled country, do not count on supplying all your wants by the way. It often happens that even at a populous *hacienda*, especially if the family be absent, you can not buy an egg, a chicken, or a pound of butter or meat. All you can be sure of finding are onions and *tortillas*, thin cakes of unleavened bread, made of corn-meal, previously steeped in lime-water. Some fastidious stomachs resent the infliction of such food; and therefore it is well to take either flour or cabin biscuits. Wheaten flour, but unbolted, can generally be had at the large *haciendas* and country villages; but it is unsafe to rely on getting fine flour except in the large towns. Bacon and canned meats must be taken from the States; for untainted bacon is almost unprocurable in a provincial town, and canned meats are costly beyond the limits of the longest purse. A two-pound can of tongue in Parral was offered as a bargain at a heavy discount at $3.50. Bacon should not be omitted from the stores. It is unnecessary to say that it contains the maximum of nourishment in the minimum of space, and can be substituted almost always for the lard which otherwise enters as invariably and repulsively as the dirt into your *mosso's* cooking.

A good *mosso* is an indispensable requisite, especially to those unacquainted with the language and the habits of the country. It is not customary for a householder, male or female, to do his own marketing. This always falls within the province of a confidential servant; and travelers therefore intrust all purchases to their *mosso*. Silver money sufficient must be taken, and this it is well to distribute in belts or wrapped in girdles to the different members of the party, and to dole it out a few dollars at a time to the *mosso*, who should be required frequently to render a strict account of his stewardship. Reading and writing in that class are much more frequent than is supposed. Your *mosso*, with the assistance of a boy, attends to the horses, keeps the commissariat supplied, cooks, prepares camp, and generally combines in his single person the functions of all the offices of a household, from the scullery boy to the valet. He usually provides his own horse, and receives $1.50 per day, and provisions and provender.

As the baggage has to be packed, it should include no cumbrous pieces

but should include plenty of blankets; for on the central plateau—except during the heat of summer, before the rainy season sets in, and often even then—the nights are cold. A pillow makes the head more comfortable than a portmanteau, and it should be provided. Warm clothing may be needed at any time—even a heavy overcoat being a comfort sometimes in the month of July. Buckskin trousers and jacket are made very reasonably in Chihuahua, and make a fitting riding-suit, except in wet weather, the jacket being tailless and the trousers not given to wrinkling. But no trousers, however faultless in fit, will make an ill-shaped saddle any thing but an instrument of torture. However suitable a good Mexican saddle may be for a long journey made at a slow speed—most of them are modeled after the letter V, and the thongs which adjust, or rather do not adjust, girths and stirrup-straps are knotted precisely under the knee—it is as necessary to take a test-ride on your saddle as on your horse before setting out on a journey of a few hundred miles; for the sum of the misery in actual pain and nervous irritation excited by straddling a rack strapped to a jerking-machine is beyond computation. Although for two or three days even a good horseman used to easy horse exercise reaches his camping ground, after a ten hours' ride, glad to lie down, and yet is uncomfortable even in a recumbent attitude, his limbs soon accustom themselves to their work, and he camps with a good appetite, and just enough of easiness to make rest welcome and his sleep sound. And you enjoy, under the open heaven, such sleep as nature never vouchsafes to the dwellers within plastered wall. On this point you and your *mosso* are sure to come to issue. If he can reach a *hacienda*, he delights to shut you up in some dreary abandoned room, with blank windowless walls and a single door. The immediate neighborhood of a village, with its biped and quadruped thieves, is not a camping ground to be preferred, and therefore you may be forced to take refuge within doors; but beware of a whitewashed room. Mexican cleanliness among the populace is confined to wearing spotless white cotton shirts and trousers, and whitewashing the walls and ceilings. How the animalcula that frequent the Mexican person resent the clean clothing is a matter for speculation; but very short experience teaches the traveler that whitewashing the walls simply drives all the flees on to the floor.

Unfortunately for his pleasure, the measure of the traveler's fatigue does not determine the length of the day's ride, but the presence of water, wood, and fodder. Hence it is not possible to cut up the journey into so many equal parts. But an average of forty-five miles a day can be got out of good animals without inflicting injury to the horse or his rider.

It is not many years ago since traveling was dangerous from robbers and murderers, and blood-curdling stories are told of the atrocities committed at certain favorite spots. But with the decline of State and federal political revolutions of late years, has declined the prevalence of crime, partly because the commission of one form of crime being repressed, the criminal classes, political and other, are deterred from indulging their propensities in other directions by desuetude; partly because there has really been exercised of late that function of government that consists in punishing wickedness and vice. It is refreshing to see the jail-gang, a good many dilapidated Yankees among them, sweeping the Chihuahua streets. As a result, robbery and murder are rare, remarkably rare, considering the opportunity which the scantiness of the population offers for their commission with impunity. Nevertheless, it is not well to go unarmed. A display of fire-arms undoubtedly excites reflection in the mind of the evil-disposed. But it is not conducive to prompt action in case of danger to so encumber one's self with weapons of offense and defense that one looks like a peripatetic armory. The most useful fire-arm to carry is a combined rifle and shot-gun. A good shot can keep a party in game almost everywhere. Partridges and wild turkeys are by no means scarce. Rabbits abound, and a small red deer every now and then faces you, apparently less alarmed at meeting you than you are astonished at seeing him. J. D., JR.

THE LAW AS AFFECTING MINING AND METALLURGICAL INTERESTS.

THE CONDEMNATION OF NON-MINERAL LAND FOR MINING PURPOSES.

The decision of the Secretary of the Interior, confirming that of the Commissioner of the General Land-Office in the case of the Overman and Caledonia silver mining companies *vs.* John Maxwell *et al.*, applicants for patent for the Yankee mining claim, Carson City, Nevada, is of sufficient importance to warrant its publication entire. The Secretary says:

Said Yankee mining claim was duly located and recorded April 21st, 1876, as containing fifteen hundred (1500) by six hundred (600) feet, situated in Gold Hill Mining District, Storey County, Nevada. The application for patent was filed in the office of register and receiver, December 10th, 1878, and within the period of publication of notice, namely, February 6th, 1879, two adverse claims were filed by said Overman and Caledonia companies respectively. Said companies are owners of certain mining claims upon the Comstock lode; and for the purpose of working the same at great depths, found it necessary to sink a deep shaft at a point about four thousand feet to the east of their said claims, whereby they could reach the lode on its dip at the requisite depth. For this purpose, they desired to obtain possession of three certain tracts of land. Two of these tracts were in conflict with the said Yankee mining claim. In order to obtain possession of said tracts, the plaintiffs, on the 17th day of September, 1878, commenced proceedings under an act of the Legislature of said State, on behalf of said Overman Silver Mining Company *vs.* John Maxwell, Philip Corcoran, and divers other persons, but including all the persons who were afterward made defendants in the said suit, brought upon filing adverse claim. Said petition alleged the non-mineral character of the land; and the defendants, in their answer to the petition, set forth and asserted its mineral character. Upon that question, at the trial, a large amount of testimony was taken, and it was found and decided by the court that the land was non-mineral; and upon further finding the necessity for the use of the land, judgment was rendered in favor of the petitioner. Upon appeal by the defendant to the Supreme Court of said State, the judgment of the court below was affirmed.

In the suit brought upon filing said adverse claims, the complaint sets forth at length the proceedings in the condemnation suit, and insists that the determination in that suit in respect to the mineral character of the land is binding upon the defendants. In their answer, the defendants aver the mineral character of the land. When said adverse suit came on to be tried, the defendants offered to prove the mineral character of the land; but upon objection, the court held that the determination of that question in the condemnation proceedings was conclusive between the parties, and excluded the testimony. Thereupon the jury, upon instructions from the court, rendered a verdict for the plaintiff, and judgment was duly entered thereon. The judgment-roll in that case, and also in the condemnation suit, are filed as exhibits in this case. In your letter of March 23d, 1881, you review these proceedings, to show that the land in controversy was subject to exploration and purchase, and that you "must hold that the law has cast upon the executive department the duty of disposing of the public land, and, as a necessary incident, the authority of determining whether certain tracts are subject to sale under certain laws." You therefore directed the register and receiver to notify all parties in interest that a hearing would be had before them to determine the following points, namely: First. "Whether the land is valuable for its mineral deposits?" Secondly. "If so, whether the Yankee location is a legal one?"

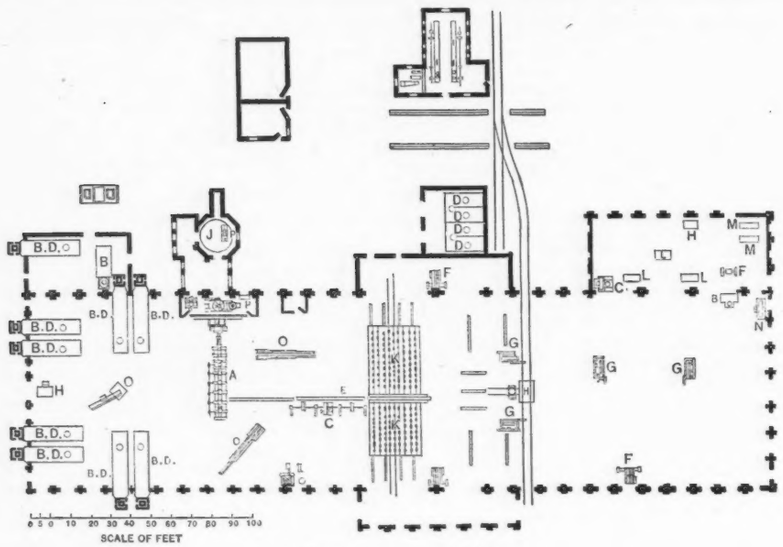
The respective parties were duly notified, and appeared, and a hearing was had before the register and receiver. Upon such hearing, all the testimony taken in the condemnation trial was given in evidence under a stipulation to that effect between the parties, together with all the proceedings had at such trial and in the Supreme Court of the State on appeal, and also the proceedings in the trial upon the adverse claims; and in addition to such testimony and proceedings, further testimony was taken at said hearing. Such being the situation of the case as presented to me for my decision, I do not deem it necessary to discuss the questions presented by the record and briefs as to the legal effect of the condemnation proceedings, or of the ruling of the court excluding the defendants in the suit upon the adverse claims from giving evidence of the mineral character of the land in dispute. The parties have acquiesced in the order made by you, and the question of fact as to whether the Yankee mining claim contains a vein or lode bearing minerals is the only one necessary for me to determine. In considering this question, it is undoubtedly competent to take into consideration the decision of the district court. The present case, however, does not require me to decide whether or not that decision is conclusive or binding upon this department, and upon that question I express no opinion. A large part of the testimony upon both sides in the condemnation suit was directed to the question of mineral character. The testimony seems to have been carefully considered in the case, and the Supreme Court of the State, upon a review of the facts and the law, affirmed the decision of the district court. Upon the hearing ordered by you, the judge who presided at the trial of the condemnation suit was called as a witness, and testified that he had had a large experience in trying mining cases in that district; that he went upon the ground and into the shaft, and made a personal examination of the claim in respect to its mineral-bearing qualities, before rendering his decision in the case. Upon the hearing so ordered by you, the applicants gave little or no testimony on their part, but rested their case on the questions of fact upon the testimony adduced by them in the trial in the condemnation proceedings. The decisions of the district court and of the Supreme Court, of the register and receiver, and of your office all agree in the conclusion that said Yankee mining claim contains no valuable minerals or lode. I have also arrived at the same conclusion. In addition to the testimony given upon the trial of the condemnation suit, the protestants examined a number of witnesses upon the hearing ordered by you. Since the Overman Company entered upon the land in 1878, a shaft has been sunk to a great depth upon the ground in controversy, at an expense of some half-million of dollars, and no mineral-bearing rock has been disclosed in sinking such shaft. The testimony given at the hearing very strongly corroborates that given by the protestants upon the trial of the suit. Taking into consideration all the testimony in the case, and giving it due weight, it clearly establishes the conclusion before stated. Your decision dismissing the applications for patent is therefore affirmed.

Very respectfully, M. L. JOSLYN, Acting-Secretary.

NEW BATTERY SCREEN.

A new form of battery screen for quartz-mills has just been patented by Mr. Andrew S. Hallidie, the well-known wire manufacturer of San Francisco. Ordinary screens are made of a single sheet of punched metal, or piece of wire-cloth of the desired size of mesh. These screens are secured on a frame which is held in place in the grooves in the battery front by means of wedges. Whether of punched metal or wire-cloth, the screens are always of flat pieces. Mr. Hallidie, according to the *Mining and Scientific Press*, branches out with the new idea of constructing the screen with angles or corrugations, so as to give more screen surface to the given size of battery opening. In the construction of the improved screen, he employs woven wire, punched metal, or any other suitable screen material, and bends or corrugates the material into angular faces or flutings. Supporting rods or bars are fixed in the screen frame, so as to pass down in the angles of the corrugations and give any desired degree of stiffness. In order to retain these screens in position, they are fixed in frames which are shaped to fit the openings in the mortar in which the screens are to be placed. The top and bottom rails of these frames have corrugated slots or grooves formed in them, corresponding with the shape of the corrugations of the screen, so as to hold them firmly in place. The screen made in this way, instead of presenting a vertical flat surface to the splash of the water, presents a series of V-shaped faces, the screen surface being thus relatively increased, and the screen stiffened and strengthened. Mr. Hallidie is confident that this construction will make the screens last much longer, as they are not so apt to "bulge" and become broken as those of ordinary construction.

THE Lechner Manufacturing Company, Columbus, O., manufacturer of elevating and conveying machinery, has received an order from the Columbus & Hocking Coal and Iron Company for a chain elevator for elevating coal at its mines at Sand Run, O. It has also made a shipment of a steel roller chain to P. D. Pugh, Yazoo City, Miss., for propelling steamboats.



A. 21′ Rail Train.
B. Furnace.
C. Engine.
D. Boiler.
E. Hot Saw.
F. Press.
G. Punch.
H. Scales.
I. Drill.
J. Tank.
K. Hot Bed.
L. Shears.
M. Lathe.
N. Grindstone.
O. Crane.
P. Pump.

Fig. 2.—The Rail Mill.

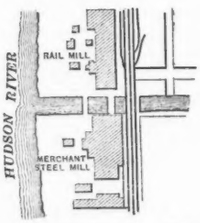


Fig. 3.—The Rensselaer Works.

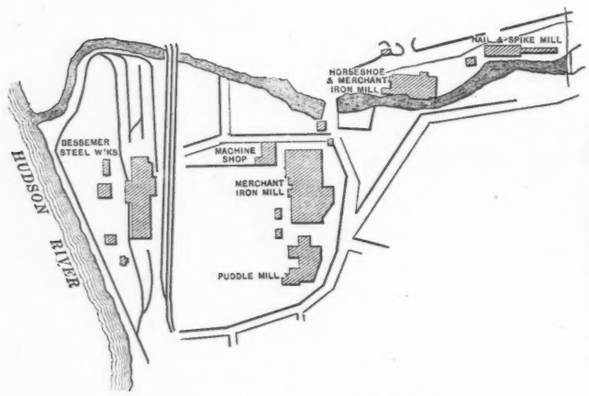
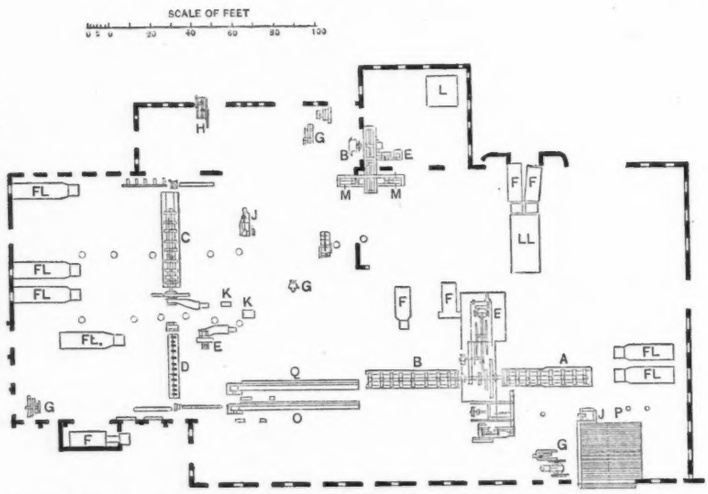
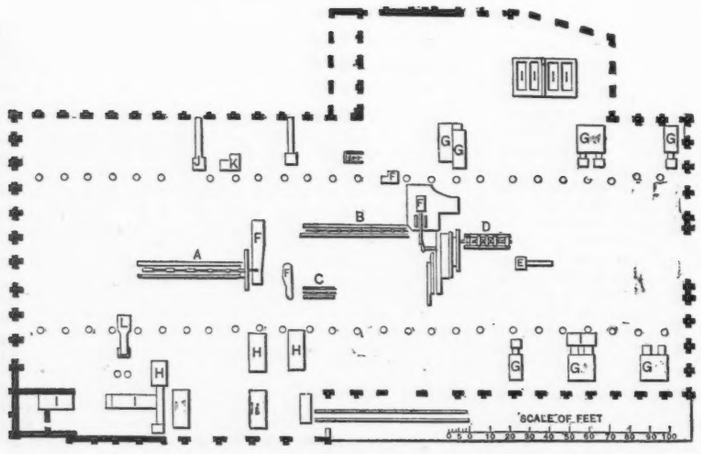


Fig. 4.—The Albany Works.



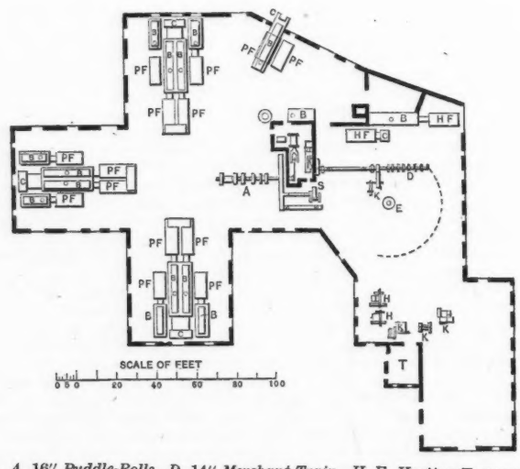
A. 18″ Merchant Train.
B. 18″ Plate Train.
C. 18″ Merchant Train.
D. 9″ Merchant Train.
E. Engine.
F. Furnace.
G. Shears.
H. Drill.
I. Fish-Bar Punch.
J. Hot Saw.
K. Pump.
L. Boiler.
M. Fan.
N. Lathe.
O. and Q. Rod-Straighteners.
P. Hot Bed.

Fig. 5.—The Merchant Steel Mill.



A. 18″ Merchant Train.
B. Wire Rod Train.
C. 12″ Roughing-Rolls.
D. Puddle-Ball Train.
E. Squeezers.
F. Engine.
G. Puddling-Furnace.
H. Heating-Furnace.
I. Boiler.
J. Shears.
K. Straightener.
L. Hammer.

Fig. 6.—The Albany Merchant Mill.



A. 16″ Puddle-Rolls.
B. Steam-Boilers.
C. Chimney.
D. 14″ Merchant Train.
E. Crane.
P. F. Puddle-Furnace.
S. Stone-Crushers.
H. F. Heating-Furnace
H. Fish-Plate Punch.
K. Shears.
T. Tool-Room.

Fig. 7.—The Star Forge.

THE WORKS OF THE ALBANY & RENSSELAER IRON AND STEEL COMPANY.

THE WORKS OF THE ALBANY & RENSSELAER IRON AND STEEL COMPANY, TROY, N. Y.

The works of the Albany & Rensselaer Iron and Steel Company, which the members of the American Institute of Mining Engineers will visit during the course of the next week, is a group of establishments formerly owned by independent firms. The Albany Iron-Works grew up under the ownership of Corning & Winslow; the Bessemer Works, the oldest of the plants now at work in this country, were started by Winslow, Griswold & Holley in 1865. The Rensselaer Works, a mile farther up the Hudson River, after upward of thirty-seven years' growth, were joined to the Bessemer Works. These different establishments are now consolidated into one large company, the Albany & Rensselaer Iron and Steel Company, of which Robert W. Hunt, the President of the American Institute of Mining Engineers, is general superintendent. The visitors will, in some departments, in some of the oldest works, find portions of the plant that remind them of the long period since which they have been at work; but they will be more struck in every direction by the evidences of a prudent desire to substitute the most modern machinery, plants, and appliances for those of an older type. These changes have been and are now gradually made, and it will not probably be long before the oldest features of the plant disappear as they become unserviceable. The disadvantages incident to the distance between some of the establishments, though closely allied in their work, as, for instance, the Bessemer mill and the rail and merchant steel mill, have been as much as possible overcome by a system of narrow-gauge railroad which connects these works, situated a mile apart. Being located on the banks of the Hudson, they have special facilities for receiving raw materials, including foreign Bessemer pig, and for shipping; cheap water transportation, too, to some extent modifying the disadvantage of being located at a great distance from the coal regions. The railroad facilities are exceptionally good, and give access especially to the adjacent New England markets.

The Bessemer Plant.—Before work was begun at this, the first Bessemer plant doing more than experimental work, a number of different American irons were experimented with at Sheffield in 1864, and a Lake Champlain iron, the Crown Point, was found especially good. A 2½-ton single vessel plant was started in February, 1865, and run until 1871, when it was changed into an ingot mold foundry. The present works were started in 1867 with two 5-ton vessels. They were partially destroyed by fire in 1868 and were rebuilt in 1869, work beginning in 1870. More recently larger cupolas and 7-ton vessels were put in. Since A. L. Holley's description of the works in *Engineering*, to which we are indebted for many details and drawings, kindly corrected to date by Mr. H. W. Shaw, four spiegel cupolas and a ferro-manganese pre-heating furnace have been put up. The Bessemer building, a plan of which is shown in Fig. 1, is 148 feet by 98 feet, with a cupola-house 80 feet by 39 feet. The vessels are set high side by side and with three ingot cranes over a shallow pit. The 7-ton vessels have 6 feet internal diameter, and 15 tuyeres with 12⅝-inch holes. They receive an average charge of 18,000 pounds. The vessel bottoms, which on an average stand 14 blows, are interchangeable, and are removable by means of lifts and of cars which carry them laterally, for repairs, under the two-side ingot cranes. They are baked in adjacent ovens. The blowing-engine and pump-room are conveniently placed on the right of the vessels, and the blooming-mill (formerly a hammer-shop for cogging ingots) comes next. As the departments grew gradually and experimentally, and were not expected to exceed 60 tons of product per day, the buildings are not of the size and arrangement that would now be made; but by means of convenient transporting apparatus, as high as 600 tons of hot ingots per twenty-four hours are delivered by power into the blooming-furnaces, and are rolled, cut up, and chipped, under a 7-ton hammer, and loaded hot on the rail-mill cars with reasonable facility.

The Bessemer blowing-engine has a pair of 54-inch diameter by 5-foot air-cylinders. It had a pair of 42-inch steam-cylinders, but a 72-inch low-pressure steam-cylinder has been substituted for one of them, and, with an improved condenser, the engine now gives a good economy of fuel. The valves of the low-pressure cylinder and a similar change of the high-pressure valves is contemplated. It indicates 500 horse-power at from 24 to 26 revolutions, with 70 pounds boiler pressure, while blowing 7 tons of metal through 180 ⅝-inch tuyere-holes at 20 pounds pressure. The four cupolas, which running together melt the iron for 600 tons of steel per twenty-four hours, are driven by two No. 7½ Baker rotary (revolving piston) blowers. They deliver air at 14 ounces pressure, and can blow 1½ pounds. A third is being put in. Blast for the spiegel cupolas is provided by a Sturtevant fan. The iron cupolas, of the ordinary deep bottom type, are 21 feet high and have a 5½-foot minimum internal diameter. They have eight 5 by 8-inch tuyeres, and melt 12 pounds of iron per pound of fuel. The latter consists of 65 per cent of anthracite and 35 per cent of coke, which keeps the charge loose and allows the blast to penetrate it freely. Four spiegel cupolas furnish the required quantity of spiegel, which is run into a ladle so arranged that, in tipping over, the ladle is slightly advanced, so as to pour out the charge quickly and completely. The materials for the two sets of cupolas are brought up to the charging-floors by two Otis hoists. There are two large Worthington compound duplex pressure pumps. The larger one is illustrated by Figs. 4 and 5, Plate I. It has a pair of 21-inch and a pair of 36-inch steam-cylinders, and four 9½-inch plungers, with 3-foot stroke. The smaller has 33⅛-inch and 19¼-inch steam-cylinders, 9-inch plungers, and 24tinch stroke.

The average production of the Bessemer plant is 12,000 tons of ingots per month. It has a record of 604 tons in one day, 3150 tons in one week, and 13,693 tons in one month.

The three-high blooming train was the first started in America, running for the first time in January, 1871. It is driven by a direct condensing-engine, with 36-inch cylinder and 4-foot stroke, and, running at 40 revolutions per minute, rolls the product of the converting-works from 15-inch ingots to 7-inch four-rail blooms by the labor of four men and boys. There are in the blooming-mill five reheating furnaces, all of them being charged and discharged by power. They are heated with bituminous coal. One of them, the last built, is to be provided with a boiler, the setting being a new type, the outgrowth of the experience at the works. The last furnace has also an arrangement for cooling the doors and frames with water, which the visiting engineers will do well to examine more closely. The water is first carried around the door-frame and then into the door, which is open at the top. The other furnaces in the mill are also to be provided with these water-doors and frames, which experience has shown work satisfactorily.

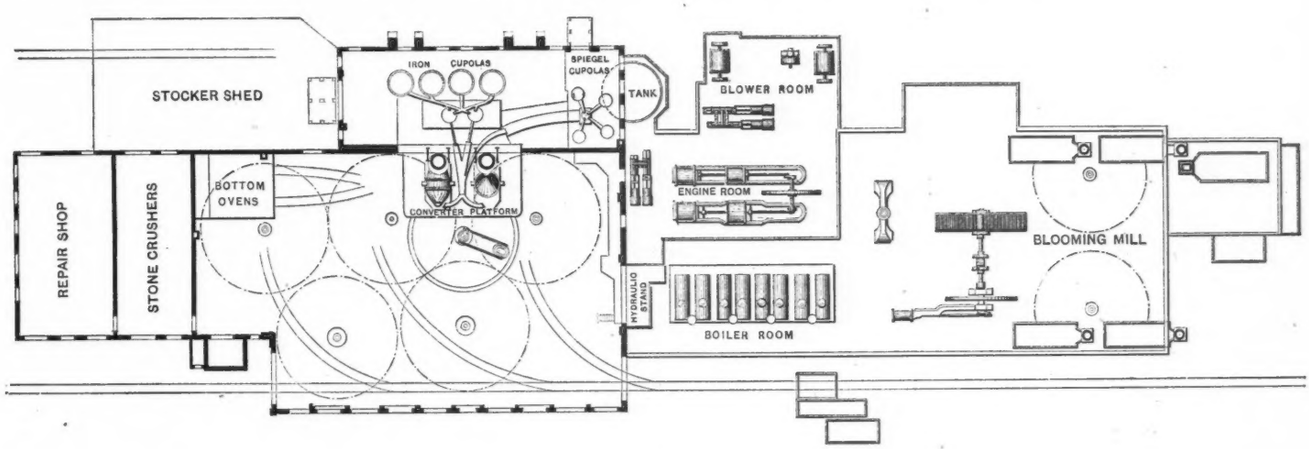


Fig. 1.—The Bessemer Mill.

The blooms rolled on the blooming train are cut into lengths by a hammer. Those not immediately carried by train to the rail and merchant mill are stored, and are subsequently handled by traveling cranes.

The Rail-Mill, a plan of which is shown in Fig. 4, is a brick building 375 by 98 feet, with the wings as shown. There are thirteen heating-furnaces *B D*, fired with bituminous coal, all but one having a horizontal over-head boiler with return flues. Ten are shown in our engraving. The train *A* is 21 inch, three-high, with three stands of rail rolls next the engine and two stands of merchant rolls arranged to deliver to the rail-sawing and finishing apparatus. The whole mill can thus be utilized as a merchant mill for medium and heavy work when this pays better than rails, or both rails and merchant steel can be produced in different turns when there is not demand enough for either product to alone fill the mill. The train has a conveyer, designed by Max Supper, for carrying off sideways automatically the scale accumulating below the rolls. When running on rails, the average output of the train is 1800 tons. It has, however, a record of 2350 tons per week. The rail-train engine is vertical condensing, with 3-foot stroke, a 44-inch cylinder, and Corliss valve-gear. With a boiler pressure of 70 pounds, it runs at a speed of 80 revolutions. The mill is provided with a Gustin hot curving apparatus and a double hot bed and finishing machinery. In one of the wings, are a number of punches and shears for cutting steel into the many shapes used for agricultural machinery.

Particular attention should be given to the press designed by S. Baldwin, of New York, for utilizing rail crop ends. The object is to press the foot of the rail into such a shape, similar to that of the head of the rail, that in afterward rolling down the crop ends sideways, it will make a plate. The difficulty is to remove the tendency of the thin foot to bend over instead of gathering together in a body having approximately a round form. Unless that form is attained, seams are created by doubling up of part of the material, and these can not be got rid of in any subsequent rolling. For some sections, the press appears to do its work admirably, so that the plate rolled from it can be used for nail plate, etc.

The Merchant Steel Mill.—The main brick building of this mill is 338 by 187 feet. This mill has an 18-inch three-high merchant train *A*, for rolling a general run of 18-inch train sizes of billets and merchant steel. It is also used for iron fish-plates. The sheet-train *B* is 18-inch, three-

high, and produces ten tons out of one furnace and an annealing furnace. Both trains are driven by a 60-inch by 10-foot beam-engine, which formerly belonged to the steamboat Swallow, which was burned thirty miles below, forty years ago. It has been recently overhauled by the Delamater Iron-Works, and is likely to see many more years of service.

A particularly interesting feature of the mill is two fast trains driven by Porter-Allen engines, which are specially adapted to work of this kind, as their use avoids the gearing. The fast 18-inch three-high train *C*, making 125 revolutions, produces per turn 50 tons of 1¼-inch 20-foot wire-rod billets from 7-inch blooms. The 9-inch three-high train *D*, also driven by a Porter-Allen engine, has been working until now only for one furnace. A second furnace, now building, will bring it up to full capacity. The mill has two Baldwin hot straighteners, improved by the engineers of the works.

The Albany Iron-Works.—These works are situated some distance from the Hudson River, at the back of the Bessemer works. The building is brick, 329 by 156 feet, with wings, and a roof with cast-iron trusses, cast in sections, one of the few probably of this design still standing. The mill contains a modern 18-inch merchant train, three-high, of the Fritz type. The train has three stands of rolls, and is driven directly at from 80 to 100 revolutions by a handsome Corliss horizontal engine, with 24-inch cylinder and 4-foot stroke, and a Bulkley condenser. This train is used for making a general run of merchant sizes, finger-bars, fish-plates, angle iron, etc. For straightening the latter, there is a machine designed by Louth, which, however, to judge from its appearance is little used. The Belgian train *B* is driven by a Porter-Allen engine, being bolted to it two to one. The same engine, having a 22-inch cylinder and 3-foot stroke, drives a stand of 12-inch roughing rolls. The engine has seen some very hard service, and yet has stood up very well under the work, running for days at a speed of 200 revolutions, and occasionally obtaining a piston speed of over 1300 feet. Note may be made in passing of a curious accident which happened to it some time since. The engine had been carefully overhauled one day, and yet within twenty-four hours broke down. An examination proved that one of the springs of the piston had worked its way through three quarter inches of metal. The Belgian train is used for rolling wire rods and small sizes of merchant iron and special shapes, such as hexagons, octagons, half-rounds, etc. The train has rolled wire at the rate of from twenty to twenty-five tons per turn, the engine running at a speed of 200 revolutions and the finishing-rolls 400 revolutions. Behind the train stands a wire reel, designed by one of the engineers of the works, which deserves careful examination. It is simple, compact, and easily handled. and has, we understand, stood the test of very rapid work admirably. These two trains are supplied by four Swindell regenerative gas heating furnaces. The mill contains besides a Cuyahoga helve-hammer for axles, an 18-inch puddle train *D*, geared to a 44-inch by 6-foot engine, a Winslow squeezer, and a 3-ton hammer. A fly-wheel has recently been placed on the train-shaft, and by having the engine run faster, a large gear-wheel and shaft could be thrown out.

The puddling-furnaces in the mill have been considerably changed. They are double furnaces provided with a small hearth for preheating the pig. The result of this and other improvements has been, that 2200 pounds of Blossburg coal and from 750 to 800 pounds of Lake Champlain ore suffice to the ton of 2240 pounds of puddle bar. They enable two puddlers and two helpers to produce 6000 pounds of bar in five heats of 1200 pounds each. Some of the furnaces are furnished with boilers, the setting of which is the design of Captain J. H. Maes. The setting is gradually finding its way into all of the puddling and heating-furnaces in the mills.

The Star Forge.—This mill, shown in Fig. 7, is an irregular building containing a number of puddling-furnaces, some of them of old design, and a scrap furnace. It has a 16-inch puddling train *A*, and a 14-inch merchant train *D*, recently moved and equipped with a modern hot-bed. These trains are driven by a 30-inch by 4-foot condensing Corliss engine.

The Horseshoe Building is 212 feet by 90 feet, with wings. It contains two modern trains for small sizes, one of them driven by an old overshot water-wheel. The nail and spike factory has a large number of machines, its principal point of interest being that cut steel nails are manufactured in it.

The maximum production of the different establishments of the Albany & Rensselaer Iron and Steel Company is reported to us as follows, in gross tons per week :

	Tons.
Ingots	3,000
Rails	1,800
Merchant steel	900
Merchant iron	1,000
Pig iron, Fort Edward furnace	210
Pig-iron, Port Hudson furnace	225

The works employ about 2500 men, to whom wages amounting to approximately $28,000 per week are paid.

THE BASIC PROCESS IN EUROPE.—From the *Bulletin du Comité des Forges de France*, we take the following statistics of the production of steel by the basic process, during the first six months of the present year :

	Number of converters.	Product. Tons.
England	1	57,900
France	2	5,960
Belgium	1	12,786
Germany	9	152,479
Austria	3	37,476
Russia	1	12,786
Total	17	279,387

In 1882, 6½ million tons of ingots were produced in the whole manufacturing world. As will be seen from the above figures, this process has met with the greatest favor in Austria and Germany; in the former country, it produces 28 per cent of the steel made, and in the latter 25 per cent, while it is only adopted to the extent of 5 per cent in England. In this country, it is in use only at one mill, that of the Pennsylvania Steel Company, near Harrisburg.

THE DUTY ON WIRE RODS.

The Secretary of the Treasury Department has issued the following circular, dated September 21st, transmitted to us by our Washington correspondent :

Several questions have been presented to this department as to duties on iron and steel under Schedule C of the Tariff of March 3d, 1883, and for the information and guidance of all concerned, the instructions below are promulgated. The fifth paragraph of Schedule C (T. I., new, 148) is as follows :

"Bar-iron, rolled or hammered, comprising flats not less than one inch wide, nor less than three eighths of one inch thick, eight tenths of one cent per pound ; comprising round iron not less than three fourths of one inch in diameter, and square iron not less than three fourths of one inch square, one cent per pound ; comprising flats less than one inch wide, or less than three eighths of one inch thick ; round iron less than three fourths of one inch and not less than seven sixteenths of one inch in diameter, and square iron less than three fourths of one inch square, one and one tenth of one cent per pound : *Provided*, That all iron in slabs, blooms, loops, or other forms less finished than iron in bars, and more advanced than pig-iron, except castings, shall be rated as iron in bars, and pay a duty accordingly ; and none of the above iron shall pay a less rate of duty than thirty-five per centum *ad valorem : Provided further*, That all iron bars, blooms, billets, or sizes or shapes of any kind, in the manufacture of which charcoal is used as fuel, shall be subject to a duty of twenty-two dollars per ton."

Provision is made in the same schedule for sizes and shapes of iron other than those named in the paragraph above cited ; and the first question presented is, whether the last *proviso* cited above applies to any iron other than that named in the paragraph which precedes it. On this point, the department decides that the provision for charcoal iron applies only to the iron otherwise dutiable under the paragraph in which it is contained.

The same schedule contains the following provisions :

(T. I., NEW, 150.)

"150. Round iron, in coils or rods, less than seven sixteenths of one inch in diameter, and bars or shapes of rolled iron not specially enumerated or provided for in this act, one and two tenths of one cent per pound."

(T. I., NEW, 180.)

"180. Iron or steel rivet, screw, nail, and fence, wire rods, round, in coils and loops, not lighter than number five wire gauge, valued at three and one half cents or less per pound, six tenths of one cent per pound."

The department decides that paragraph 180 contains the provision which must govern the rate of duty on the merchandise specially described therein.

This leaves round iron in coils and loops, not lighter than No. 5 wire gauge, valued at 3½ cents or less per pound, not rivet, screw, nail, and fence wire rods ; round iron in coils or rods, lighter than No. 5 wire gauge, or which is valued at more than 3½ cents per pound, and bar iron, round, less than $\frac{7}{16}$ of an inch in diameter, which is not enumerated in paragraph 148, liable to duty under paragraph 150.

It is borne in mind that section 2499 of the new tariff provides that, if two or more rates of duty shall be applicable to any imported article, it shall be classified for duty under the highest of such rates, but it is held that this provision does not affect the rate of duty on articles comprised in paragraph 180, which are specially provided for.

DIAMOND MINING IN THE PROVINCE OF MINAS-GERAES, BRAZIL.

The discovery of the first deposits of gold in the province of Minas-Geraes, the most productive in Brazil, led to the search for diamonds as early as the close of the seventeenth century, the first being found at Serro. The fever spread, and, moving northward into virgin country, founded the village of Tijuco, the Diamantina of to-day and the center of diamond mining in Brazil now. M. A. de Bovet, professor at the School of Mines of Ouro-Preto, Brazil, has recently, in the *Annales des Mines*, Paris, printed an exhaustive and highly interesting account of a visit to that section, and from his paper on the history and present status of the industry we have gathered the following notes.

At Diamantina, as elsewhere, the river-beds were first worked for gold, and tradition says that, while the miners had noticed the existence of bright stones in their pans, and had collected them as curiosities, it was only when a passing traveler revealed to them their value that they began to gather them. All that is definitely known is, that in 1729 the Portuguese government was informed of the existence of diamonds in the vicinity of Tijuco. The government at Lisbon promptly ordered the authorities of the province to issue ordinances designed to secure to the government the largest possible share of this new source of wealth. Compared with others which followed, the first laws were liberal. They simply withdrew the titles to all claims for gold washing already allowed, permitted only mining for diamonds, distributed the ground anew, allowing no one person to hold more than 36 feet square for every hand employed, and levying a sum of 28 francs for each person at work. Contradictory orders followed one another in quick succession, and the impost per hand was rapidly run up to 224 francs per man. In 1734, the government ordered the entire cessation of work until it had devised such methods as promised to yield it the largest returns. After five years of suspense, the government finally decided to farm out the mining of diamonds. An administration was created at Diamantina, at the head of which was a functionary, bearing the title of "intendant of diamonds," whose duties were to carry out the laws and hold the contractors working the mines to their agreement. The contractors, who were assigned a certain territory, had to employ a given number of slaves, usually six hundred, and could not under any circumstances employ more. Between 1740 and 1761 six such contracts were let, and the contractors had to pay for each man employed, whether he was working or not, a sum which was gradually raised from 1288 to to 1344 francs. The contractor had to send his diamonds to Lisbon, where they could alone be sold. While such were his obligations, he had,

on the other hand, the exclusive right to mine. The intendant had to guard his right and carry out the laws enacted for his protection, among which the following may be quoted to show how severe the restrictions were. No person was allowed to buy, sell, or export diamonds under heavy penalties. Accusations from informers, even if secretly made, were received by the authorities, and where they led to conviction, one half of the confiscated articles belonged to the informer, who, besides, if he was a slave, was given his liberty. No person was allowed to enter the diamond district without special permission of the intendant. If a merchant, he had to state the character and value of his goods, and on leaving the district prove an equal quantity of value. No one was allowed to possess any tools except those required for his work. With all these safeguards, there was a large class of men, called garimpeiros, who did mining on their own account, their principal difficulty being to get tools. It is stated that slaves who had escaped made them from the chains around their necks. Both the government and the contractors had bodies of men in their employ whose sole occupation was to hunt down this class of men.

Some of the contractors did an enormous business, in certain cases very lucrative. Two of them had all or a part of their possessions confiscated under trumped-up charges.

After the sixth contract, the Portuguese government, which had adopted the system mainly to ascertain the results that regular working of the mines would lead to, decided to work them on its own account, and in 1772 the administration at Diamantina was charged with it.

The intendant became all-powerful. He was the executive who carried out the laws, and was the only judge, having no tribunal to aid him. There was no appeal from his decisions, and, as the regulations put it, he was to judge as rapidly and with as little formality as possible. Some modifications were made of previous laws. Two of them are curious enough to be mentioned. The first absolutely prohibited the entrance into the territory of any one who had ever studied law. The second referred to informers. Any informer could carry his statement, written, but not signed, to the intendant, who dated and indorsed it, and gave it back to the one who had submitted it. From this moment, this slip of paper could be transferred to any body, could be sold and bought. It was a bill to bearer. When the process against the person accused had been decided, and the confiscation had been made, the bearer, whoever he might be, had the right to claim his share of the amounts confiscated. If the bearer was a slave, he obtained his freedom besides. This new system, begun in 1772, was carried out more or less rigorously according to the individuality of the ruling intendant, until the year 1845, when it was officially abolished, although after 1822 it languished, from the absence of funds.

The administration bought a certain number of slaves from the last contractor and hired others throughout the country. When it paid well for them, their owners hired them gladly; but when the mines were not doing well and they could not pay much, the government generally succeeded in getting the slaves by threatening the owners. Thus it generally had a good force, and at times employed more than 4000 slaves in the mines.

Little is known as to the quantities of diamonds obtained during the period when the contractors had charge of the mines. For the time when the government worked them, accurate figures are available. From 1772 to 1845, the produce was 269,870 grams of diamonds, there being 80 stones exceeding 3·5 grams in weight. In twenty-three years, from 1772 to 1795, 174.842 grams of diamonds were mined at a total expense of 38,706,090 francs, besides 3,169,460 francs worth of gold. The average cost declined from 203 francs per gram during that period to 195 francs between 1796 and 1801, and 162 francs between 1801 and 1806.

THE DIAMOND DEPOSITS.

Diamonds are found in Brazil in the provinces of Minas-Geraes, Bahia, Parana, Matto-Grosso, and Goyaz. In Minas, they are mined at Diamantina, Grao-Mogol, Bagagem, Conceicao Cocaes, and other points, the first named, however, being the most important. Diamonds are found in a rounded gravel having peculiar characteristics, which is called by the miners "*cascalho*." It is a mass of small pebbles, chiefly quartz, mixed with very little clay. If examined with care, it will be found to contain a large number of minerals, many of which are present in the cascalho from all the districts. At Diamantina, Gorceix has discovered rutile, anastase, arkansite, tourmaline, titanite, fibrolite, klaprothine, psilomelane, disthene, pyrite, magnetite, garnet, talc, mica, staurodite, sphene, euclase, and gold.

The cascalo, itself occurs in the form of deposits in the river-beds, on the river-banks, sometimes at a considerable altitude, and in high plateaus. The existence of the diamond gravel in the river-beds explains itself. It is generally rich, and contains a greater number of large diamonds near the sources, and finer diamonds at a greater distance from them. The gravel is pretty irregularly distributed in the river-beds, and generally reaches its greatest richness in what is called a *caldeirao*, or kettle. The caldeirao is an almost spherical excavation, becoming cylindrical when it is deep, cut into the bed-rock. It has smooth sidewalls, as though it had been drilled out. Such caldeiraos are found when the character of the ground has tended to produce eddies, and it will be understood how the stones carried about by this movement, and for long periods turning on the bottom, should have ended in making these excavations. They are even found in rivers which do not carry diamonds. The diamonds, of course, not only cut the bed-rock, but also the pebbles moving with them, until they were reduced to such a state of fineness that they were carried off. By this action, the diamonds accumulated and the cascalho was enriched. The miners well know this, and consider those points of the river which tend to produce eddies particularly favorable. Nowadays, this indication has lost much of its significance, because the rivers have been worked over so often that there is the greatest uncertainty as to whether the ground is virgin or not. The diamond gravel is covered with a layer of boulders of considerable size, which must be generally blasted to be removed. Above it is generally sand of recent origin which is absolutely barren. The thickness of the latter varies a good deal. Sometimes it is only from 5 to 15 feet; sometimes, at points where the river-bed has been much deepened, or where a picao or pit has been formed, in the shape of an enormous caldeirao, the bed of barren sand reaches a thickness of from 75 to 100 feet. These, of course, are rich spots, but they are very difficult to work.

The bank deposits, at least those not high above the river-bed, may have been formed in the same manner as the river deposits when the streams carried a much greater body of water. They are also covered with a layer of barren material. As for the plateau deposits, their origin is more doubtful. They consist of a coarse cascalho gravel scattered over the surface without being covered, so that the miners say that diamonds may be found at the grass-roots.

THE Murphy Champion Ventilator has now been in successful operation for ten years, and its merits as a ventilator for mines and tunnels are well established. Messrs. Fraser & Chalmers, sole manufacturers of this ventilator, have issued an illustrated catalogue fully descriptive of the machine. The ventilators are made from 3 feet to 10 feet diameter. The sizes generally used are as below: 4-foot fans, all complete, including all wood-work, without engine or main belt, weight 3300 pounds, costing $450; 6-foot fans, including all wood-work, weighing 6000 pounds, costing $650; and 8-foot fans, including all wood-work, weighing 13,000 pounds, costing $1000. The cost of belt for driving ventilator depends upon its length, the location of engine to pulley on the ventilator determining this. Generally, the steam for the engine driving the ventilator is taken from the hoisting-works boilers at the coal shaft. If power is wanted for driving ventilators, the builders advise: Engine 5 by 6 for 4-foot ventilator, weight 1200 pounds, cost $225. Engine 6 by 10 for 6-foot ventilator, weight 1800 pounds, cost $300. Engine 8 by 12 for 8-foot ventilator, weight 2800 pounds, cost $450.

FURNACE, MILL, AND FACTORY.

Messrs. Fraser & Chalmers, of Chicago, have just concluded a contract for a 40-ton copper smelting-furnace all complete with blast-pipes, water-pipes, Baker blower, crusher, engines, boiler, etc., for the Concordia Mining and Smelting Company, Mexico.

The Solid Steel Casting Company, Alliance, Ohio, an outgrowth of the Morgan & Williams heavy engineering business, is now in full operation. The works are established for the purpose of supplying heavy steel parts of mechanical appliances and machinery in place of iron, and have a process for casting steel which has been thoroughly tested.

The plate and sheet-mill of the Laclede Rolling-Mills, St. Louis, has been started up, and other departments of the works will probably be put in operation later on.

The Johnstown *Tribune* reports that, in accordance with notices posted throughout the buildings, the Gautier wire-mill closed down on Saturday evening, September 22d, and will remain idle for one week, or until repairs that are necessary have been made. The temporary stopping of the works will also afford an opportunity to reduce stocks, which are large, and somewhat greater than the actual demand.

In the suit in equity brought by the Mount Hickory Iron Company, Limited, Sharpsville, Pa., against James B. Pierce, manager of the Mount Hickory Furnaces, with the object of ousting him from the position, Judge McDermitt has filed his opinion refusing the injunction asked.

The Calumet Iron and Steel Company, of Chicago, has just finished experiments which have resulted in the perfection and erection of a plant for the manufacture of steel nails.

Messrs. Fraser & Chalmers, of Chicago, are now erecting at the works of the Eckstein White Lead Company, Cincinnati, O., a Corliss engine 26 by 48, with a large amount of shafting, pulleys, etc.; for the Bismarck Elevator Company, Bismarck, Dakota, a 12 by 26 Corliss engine, two boilers 44 by 14 feet, and other machinery; for the Miltimore Car-Wheel Works, just organized, about to be built at Garfield, one of the suburbs of Chicago, a Corliss engine 22 by 48, with two tubular steam-boilers 60 by 16 feet; and they have recently completed at the brewery of John F. Betz & Sons, Philadelphia, Pa., two Corliss engines 18 by 42, with air-pumps and machinery of the Boyle Ice-Machine Company's design. They are also building for the Boyle Ice-Machine Company two 15 by 30 Corliss engines, for Ohio, with ice-machines complete, and two of the same size for Texas.

The Linden Steel Company, Limited, Pittsburg, has completed the erection of a 20-inch plate-mill, and has every thing ready for sheet and plate of tank and boiler qualities. This makes two plate and sheet-mills (one of 18 inches and the other of 20 inches diameter), one bar-mill (18-inch), one rod-mill of 10 inches diameter, one universal mill, and three hammers; showing that the company has increased its capacity very greatly.

An axle made of the "Refined Bessemer" produced by the Pittsburg Steel Casting Company, stood what is considered an extraordinary test: Three blows at 10 feet, two blows at 15 feet, two blows at 20 feet, and five blows at 27 feet, with a drop weighing 1640 pounds, reversing axle each blow. The operation was continued until those testing decided that, if they continued hammering all day it would not break. A round of soft steel was hammered while cold, with a steam-hammer, water being poured on the faces of the anvil to keep them from heating. This was continued until the round was flattened out, not the slightest crack appearing. This same steel pulled 71,400 pounds, showed a reduction of 80·6 per cent at point of fracture, elongation in 8 inches of 28·7, limit of elasticity 49,400 pounds.

The Gates Iron-Works, Chicago, have just shipped one of their No. 5 crushers with elevator and screens to the Philadelphia & Reading Railroad, to be erected at Hopewell, New Jersey. They have also consigned a number of smaller crushers to towns in Illinois, Indiana, and Pennsylvania for breaking rock for street-paving, and also a No. 3 crusher to Blairsville, Pa., for use on the Pennsylvania Railroad.

The Harrisburg *Patriot* of a recent date says: The largest run ever made at the Pennsylvania Steel Company's works, Harrisburg, was that of Thursday, and it is pretty safe to say that it has never been equaled in any part of the world. In twenty-four hours, three turns were put to work, each being employed for eight hours. The first turn, known as "C," started on Wednesday at two o'clock in the afternoon, and quit at ten o'clock at night. In that time, 53 heats were made and 954 rails turned out. The "A" turn relieved the "C" men, and continued until six o'clock the next morning. Fifty-four heats were made and 972 rails. The last turn, "B," eclipsed each of the others by making 57 heats and 1026 rails. During the entire twenty-four hours, 164 heats were made and 2952 rails turned out, being an average of 2⅛ rails per minute.

E. W. Blatchford & Co., of Chicago, are building a new addition to their works, 80 by 100 feet in size and three stories high. They will also add a large amount of new machinery, embracing a complete mill for sheet and bar lead, a shot-tower, etc., and otherwise greatly increase their capacity.

Contracts have recently been awarded to the Keystone Iron-Works Company, of Kansas City, for the construction of four slide-valve engines of 50 horse-power each, and boilers for the same, and for one automatic engine. This company has just completed a double hoisting-engine, of 70 horse-power, for the Rich Hill Coal Mining Company, and a 25 horse-power engine and boiler for the

Huggins Cracker and Candy Company, of Kansas City. It has also recently built an engine and boiler for John Wuerth, Holton, Kansas, and one for W. C. Johnson & Co., Solomon, Kansas. This company is constantly adding new machinery to its plant. Among the specialties made by the company may be mentioned a patent pump, driven by two cylinders of 175 horse-power, for the smelting-works at Argentine, Kansas. By the use of this pump, the metal which heretofore has been lost through the flume is passed through the pump and saved. In the milling department, the company has just completed a 7-reel bolting-chest for a flouring-mill at Dodge City, Kansas.

The Hotel Oxford, on Huntington avenue, Boston, just completed, is furnished with four of the Whittier Machine Company's steam-elevators—two for high-speed passenger service, two for freight.

GENERAL MINING NEWS.

ARIZONA.

COCHISE COUNTY.

COPPER QUEEN.—Work continues as usual.

HENDRICKS.—The mine is leased to the Tombstone Mining and Milling Company, and produces ten tons of high-grade lead ore daily, which is shipped to Charleston.

TOMBSTONE DISTRICT.

The *Epitaph*, in its review of operations at the various mines, states that a satisfactory condition of affairs is shown throughout the district. The quantity of ore daily extracted is fully up to the average, while the bullion product at the mills shows no diminution in the richness of the ore. The steady progress made on the Contention pumps is gratifying, and the announcement that the anxiously awaited work of draining the lower levels will be commenced on December 1st will be hailed with rejoicing throughout the camp. Fears have been entertained by some that the capacity of the new pumping machinery would not be sufficiently great to handle the volume of water in the lower levels of the hill properties. It is stated, however, by competent authorities in Tombstone that such fears are groundless, and that the Contention pumps, when in place and worked in conjunction with those of the Grand Central, would be enabled to successfully overcome a much larger body of water than that with which they will have to contend.

GIRARD.—Work has been resumed.

PEABODY.—A strike of a new body of ore in this mine, which is located at Johnston, is reported. The thirty-ton copper furnace is running steadily, and there is some talk of the company erecting another large one of fifty tons.

SAN DIEGO.—The furnace is to be started up shortly at this mine, which has been idle for some months.

TOMBSTONE MINING AND MILLING COMPANY.—At the Luck Sure, the ore-body is increasing, both in quality and quantity, some of the ores carrying as high as forty per cent in lead, making the same a very desirable smelting ore. The shipping of 200 tons of ore to the company's furnace at Charleston has just been commenced.

WAY UP.—Since the last court decision, this mine has been under a lease, and quite a quantity of high grade ore has been extracted, the same milling from 97 to 800 ounces of silver to the ton.

MARICOPA COUNTY.

TIP TOP.—It is learned from the Phœnix *Gazette* that this mine, after having produced about $2,000,000, will shortly be closed down for good. The company's books show a debt of $95,000 over and above the production of the mine. By the sale of supplies, the superintendent realized sufficient to pay off all the debts at the mill and mine. He is now running the mill, working over a few tons of tailings. When this is done, the mill will be closed down and the last man discharged.

MOHAVE COUNTY.

THE LOS BASINS AND GOLD BASINS.—Writing from Williams, under date of September 3d, Mr. J. C. Bramwell reports to us as follows: While the mining fever is assuming such large proportions in our neighbor, New Mexico, it would be doing ourselves a great injustice not to speak of the precious metal which, though yet undeveloped in many sections of this territory, still bids fair to surpass even our own sister territory, and prove of incalculable value to those who have ventured to penetrate a section of country up to within a recent period in the hands of savages. This obstacle has now been removed by the advent of the railroad, which has reached the Colorado River. Here is the section of country called Los and Gold Basins, situated in Mohave County, Arizona. These two mining camps are as yet in their infancy; but according to the reports of one of the most reliable and best informed of mineral prospectors in this section, Mr. J. S. Coon, their resources can not be equaled for the amount of ore in sight. A thorough and searching examination having been made by him of these camps and surroundings, he is competent to speak on their merits. The following statement best describes the condition of the country: The camps above mentioned are 45 miles north of Hackberry, which is a stirring camp on the line of the Alantic & Pacific Railroad, containing a ten-stamp mill running night and day on free-milling silver ore. The road leading from here to the Los and Gold Basin camps is so smooth that a basket-phaeton could be driven from Hackberry to within one mile of the mines, without the slightest injury. The Colorado River runs on the north boundary of this camp, and will furnish water-power sufficient to turn all the machinery needed, and shafting up and damming can be done with comparative ease and safety. The road from the mines to the river leads down-hill; and ore has a natural drift in that direction, which makes the hauling of it merely nominal, and places the mill and mines in close proximity. There is a natural foundation for a dam and mill, there being a small mountain of granite in the center of the river at the head of the rapids, which would furnish a sure hold for the dam. The cost of water-power, compared with steam, makes the operation of milling the ores comparatively cheap. The formation of this country is granite, and the leads true fissures. They can be traced from one claim comrising 1500 feet to three and even five miles, and will assay from $25 to $300 per ton at the surface. The ore is mostly free milling. Some is base with copper; some contains from 0·9 to 22·8 per cent copper. On the east side of Los Basins camps, there are several good ledges of galena, with no development whatever. Little is yet known of these camps, as they have been examined by but one expert, and then only an imperfect examination was made. It revealed sufficient to convince him, from the large quantities of good ore above ground, of the great value of its mineral properties. It was here, where the small boulder of quartz was found containing $700; also the piece of float that assayed $96,000 to the ton; and the lead is yet undiscovered. On the Ida mine, there is a shaft 25 feet deep, showing a vein 7 feet in width. There is no other mine in Los Basins that has more than 12 feet of work done, and all ore taken out thus far is good milling ore. The camp is well supplied with water; no prospect being over six miles from the river. There are four springs in easy reach—Burro Springs, four miles distant; Grape Vine Springs, six miles; Grass Springs, seven miles; and Patterson Wells, six miles. This, for Arizona, is a decided advantage over other camps, which should not be overlooked. Work can be done the year around; but the winter season is the most pleasant. Snow seldom falls, and only in small quantities. The supply of charcoal is abundant; the timber being only fifteen miles from the river. If smelting be considered, coke can be had in sufficient quantity from Hackberry.

PIMA COUNTY.

TUCSON SMELTING AND MILLING COMPANY.—The county's appropriation of $15,000 in bonds to the person who erects the first smelter has attracted Aaron Mason to the scheme, and the above company has been organized upon the basis of 20,000 shares of $5 each, of which Tucson takes 5000 shares, or $25,000, thus placing $40,000 in subscription and bonds at the disposal of Mr. Mason, who subscribes the rest of the stock, namely, 15,000 shares. The capacity of the smelter is 60 tons a day. The smelter is to be close upon the junction of the railroads, and the company will buy all sorts of ore, in lots from 50 pounds and upward. These facts we gather from local papers.

YAVAPAI COUNTY.

HIDDEN TREASURE.—Some good ore has been found at a depth of some 300 feet. It is evident, from all experiments made on Turkey Creek, that the great ore-bodies of the district are not found until a depth of from 200 to 300 feet is attained. Surface workings show that the ore is scattered all through the veins; but, as above stated, when a proper depth is attained, the ore becomes concentrated in solid bodies and of a richness which justifies the outlay necessary in sinking. The company's mill will probably start up shortly.

CALIFORNIA.

MONO COUNTY.

CARBONATE.—McLaughlin & Co. are working this mine situated at Benton. They have developed a fine prospect. The ledge improves in quality and quantity as depth is reached.

PLUMAS COUNTY—GREENVILLE DISTRICT.

GOLD STRIPE.—According to the *Bulletin*, work has been stopped at the mine. The mill will continue to run but a short time, when all the ore now at the dump will be worked up. It is reported that there is no ore in sight in the mine, and that no prospecting will be done unless the shareholders furnish the money.

SIERRA COUNTY.

A prospecting company has been formed in Grass Valley, and it is its intention to keep experienced miners on the road all the time; these experts to prospect for mines and examine mines and report on them. Same parties have started out for a trip through Sierra County.

IDAHO.—The mine is improving, and some good ore has been taken from the bottom of the shaft below the 14-foot level.

PEABODY.—The company has leased its mine for two years, and every thing is now getting into order for work, which will be commenced as soon as water can be had.

CANADA.

PROVINCE OF NOVA SCOTIA.

OXFORD.—It is reported that the property at East Chezzetcook, east of the gold mines of this company, has been purchased by the Oxford for $20,000.

COLORADO.

CHAFFEE COUNTY.

One of the most important elements affecting the prosperity of the Monarch Mining District is the completion of the extension to Garfield of the Maysville branch of the Denver & Rio Grande Railroad.

CLEAR CREEK COUNTY.

Following is a statement of ore-shipments from Georgetown during the month of September:

Shipped from	Tons.	Value in dollars.
Boston & Colorado Works	291	$28,029
Silver Plume Sampling-Works	210	19,800
Miners' Smelting Company	110	12,100
Morris & Noone	222	27,350
G. W. Hall & Co.	15	4,270
Lawson and Silver Creek		
Total.	848	$91,810

Besides the above amounts, the Moline Tunnel Company has been shipping from its side-track a short distance below the depot sixty tons a day to the concentrating mill at Lawson.

MICHIGAN.—This property has lately been purchased by a gentleman from New Orleans, at an outlay of a few hundred dollars, and after the expenditure of a few hundred more has developed a value of many thousands. Tests recently made gave of yellow copper $131.65 and of gray copper $111.80 to the ton, and the average of the whole four-foot streak returned $42.80 to the ton.

MOUNTAIN CITY.—This lode at the head of Spring Gulch is down 160 feet. Heretofore, the ore has been greatly scattered, but is now getting more and more compact. Over one inch of solid gray copper, together with 10 inches of galena with copper and iron pyrites, is now in the shaft. Mill-runs have been had at Black Hawk showing 266 ounces in silver. Shipments will be made weekly.

PERKINS TUNNEL.—This lode on Spring Gulch is driving on a 100-foot contract. At 70 feet in depth, the tunnel is showing up finely. Streaks and bunches of gray copper, with iron and copper pyrites are fast coming in as depth is gained. The gold quartz on the foot-wall remains in place. Nuggets and wires of fine gold are found in the seams. With 100 feet of development, there is no doubt but that this mine will be a steady producer of ore in paying quantities.

RED ELEPHANT.—The properties of this company, which consist of the White, two claims aggregating 3000 feet, Boulder Nest, 1500 feet, and the Free America, 1500 feet, are reported to be in a flourishing condition.

GILPIN COUNTY.

COLUMBIA.—This enterprise began operations about a year ago. The tunnel has been driven since that time 600 feet from the tunnel entrance under Quartz Hill. Situate as it is above Quartz Hill tunnel and below the Central City tunnel, it will be the means of opening up and draining a large number of veins. Several veins have been cut, among them a lode abandoned some years ago, where the tunnel is connected with a shaft sunk to a depth of 110 feet, which affords splendid ventilation to the tunnel. On the foot-wall of the Argo, was found quite a streak of mineral, but of too low grade to be made profitable at the present rates charged for treatment of refractory ores. In and near the breast of the tunnel, two lodes have been struck, the Argo and Vedette, both of which are patented properties. At this point and along the back of the tunnel, there is a large wide crevice which carries considerable mineral. The promoters and owners of the tunnel have ample dumpage ground below the mouth of the tunnel in the gulch to dump waste material. Good headway is made in the tunnel breast, the ground being easily broken. Last month, the tunnel was driven by two shifts, three men on a shift, 67·7 feet in twenty days, at a cost of $4.70 per foot. One man will break enough crevice-matter in one shift to keep two men tramming.

MINERS' WORKS.—The new McNair furnace at these works in Golden is reported by the *Globe* to be a success. A test run made recently treated 53 tons and 1400 pounds of ore more than the other furnace, with 48 tons less fuel. This company has the exclusive right to use this furnace in Colorado, and it is its intention to change all old furnaces for this kind as soon as possible.

REPUBLIC GOLD MINING COMPANY.—In the case of this company, the property of which is situated on the Pewabic Lode, Russell District, where the end-lines of the location were not parallel, in conformity with law, the Secretary of the Interior has decided that the location shall be accepted as it now stands.

FREMONT COUNTY.

ROYAL GORGE SMELTER.—This smelter, located near Cañon City, with two Hall & White stacks, and a nominal capacity of 100 tons a day, gives employ-

ment to sixty hands, and does much to sustain the business character of the town. It has, however, been seriously hampered for want of capital to carry heavy stocks that would enable it to compete with other places in the purchase of ores. This is now to be remedied. The smelter has been cleaning up, and on the 26th blew out entirely, with all stock worked up. It will open on the 15th of October with a large backing of Pittsburg capital, which will enable it to take a place among the strongest works of its kind in the country.

ROCKY MOUNTAIN MINE DEVELOPING COMPANY.—This organization, owning the Green Mountain copper mine, seven miles south of Parkdale, and representing Chicago capital, broke ground for its new works on the 25th of last month. The smelter will be located about half a mile below the town, on the river-bank. It will employ hydraulic power, but will also be rigged with steam for emergencies. Most of the plant is already at Cañon, and the work will be pushed without delay. It will have one blast-furnace, with a capacity of 60 tons a day, and the first efforts will be confined solely to the treatment of the company's own ores from the Green Mountain mine ; but there is a project of indefinite enlargement as time and capital serve, and the ultimate purpose is to secure the great facilities of Cañon in the way of cheap fuel, cheap flux, and cheap power, to become extensive smelters of copper ores. The furnace is one of Rankin, Brayton & Co.'s stacks, with sufficient engine and crusher capacity to run three additional furnaces. The company has 4500 feet on a very wide lode, carrying oxides and sulphurets, with from 2 to 3 ounces of silver and half an ounce of gold, and from 10 to 16 per cent of copper. Work will be confined to smelting for matte for the present. The mine is opened by a main shaft 100 feet deep, and a winze below that level of 45 feet, the latter in ore. On a distance of 1000 feet, there are 13 test pits, one of them being 45 and the other 40 feet deep. The president is Mr. Wilbur K. Johnson, of Chicago ; the general manager, W. E. Johnson ; the secretary, Orson G. Stanley, who is now in this city ; and the treasurer, J. W. Harrison, of St. Louis. The capital is $3,000,000. The company proposes to do custom-work in the future.

GUNNISON COUNTY.

RICHMOND.—This mine has been sold for $40,000. Regular shipments will be made. The developments consist of shaft, 100 feet, and tunnel ; pay-streak, three feet ; mill-runs, 750 ounces.

LAKE COUNTY.

ARKANSAS VALLEY SMELTER.—This company has all five of its furnaces in blast. The establishment is turning out about three car-loads, thirty-three tons, of bullion a day. The product of the works is sent to the Kansas City refinery.

CHRYSOLITE.—Exploration-work from the All Right No. 2 shaft, situated northwest of the company's office buildings, has been resumed. The shaft has a depth of about one hundredfeet, and discloses a large body of iron. Upon this, drifts are now driving to the east and north, and upward of one hundred feet of drifting has been done. So far no pay ore has been found, but the exploration-work discloses some fine iron ore. Work on the "Iron" incline has been nearly suspended. In the absence of a suitable pump, it has been found impossible to handle the water, and in consequence the advance of the incline is delayed. A large Cameron pump is now on its way from New York, and is expected here in a few days.

DOUBLE DECKER.—This mine, on Yankee Hill, just this side of the Adlaide, promises to become again a producer of rich ore, having recently disclosed very high grade chloride. For six months or more past, the mine has been worked on a lease by Colonel Rush Field and others. Until within the past few days, the results of the work done by these parties were any thing but satisfactory, and it is doubtful if persons could be found in Leadville, that, under all the discouraging circumstances encountered by Mr. Field, would have continued with the same energy and persistency that he has displayed. On last Saturday, a seam of ocherish mineral was struck, which on close inspection showed chlorides of silver. The streak was followed up and soon improved in strength and value, until, at the present time, an eighteen-inch body of ore has been opened in which the occurrence of lumps of horn-silver is very frequent, while the entire mass is impregnated with bromide and chloride of silver. About three tons of this mineral have been hoisted to the surface, from which assays have been obtained ranging from 97 to 747 ounces to the ton. This does not include assays of the higher grade of ores. A shipment will be made to the smelters in a few days.

GERTRUDE.—The strike in this mine, adjacent to the Venture lode, in the Little Frying Pan District, promises to be quite important. The vein is identically the same as the one opened in the Venture, and had previously been explored by a number of shafts. On account of the difficulty encountered by the large flow of water, it has been determined to drive a cross-cut tunnel to intersect the vein. The work was begun during the early spring, and about ten days ago struck the vein at a distance of 210 feet from the portals of the tunnel, and at about seventy-five feet below the surface. A level was next started on the vein to the northward, and at fourteen feet from the tunnel encountered an ore-chimney which has since been penetrated for a distance of twenty feet, showing a three-foot face of mineral the entire height of the drift, giving an average assay of 129 ounces in silver to the ton ; while assays have been obtained running as high as 221 ounces. The northern end-line of the claim is still 200 feet distant. Considerable ore has already been extracted, and shipments will be commenced shortly.

IRON SILVER.—The California Gulch properties of this company are doing well, the Stone mine maintaining its regular production of two hundred and fifty tons of ore a day. The lessees on the Rock mine are shipping about twenty tons daily. The incline on the Stone claim, which was driven some years ago, and not given enough pitch, is to be rebuilt. The incline is about four hundred feet in length. A winze is sinking to determine the depth of the contact, in order to ascertain the correct pitch to be given the new incline. No. 5 Stone shaft, which was recently supplied with hoisting machinery, is doing well and yielding a large amount of ore. The shaft has been connected with ore-bodies left beyond the face of the old Rock incline, by a drift. At the Moyer shaft, a second large boiler is getting into position. A building for an engine-house is also going up 180 feet east of the shaft. The seventy horse-power engine formerly in use at the Iron mine incline will be placed in position here, and will be connected with two drums. The water in the Moyer shaft has lately decreased to a considerable extent, and the sinking of the shaft was again resumed.

MAID OF ERIN.—A shipment of fifty tons of ore to the Elgin smelter showed that the mineral ran 140 ounces in silver to the ton, and contained fifty-nine per cent in lead. Pending the decision of Secretary Teller, the mine is doing nothing.

MORNING STAR.—It is said that the Lower Waterloo mine, of this group, contains a seam of ore from one to eight inches in thickness, averaging 797 ounces in silver to the ton, and carrying twenty-four per cent of lead. A wagon-load shipped to Cumming & Finn's smelter the other day netted over three thousand dollars.

NEW ENGLAND.—The Ohio Bonanza tunnel, situated near the California Gulch, is worked and extends good promises of developing an ore-body. The property is owned by the New England Company. The tunnel is in over 200 feet, and is reported showing a well-defined vein, assaying from six to seven ounces in silver and two tenths ounces in gold to the ton.

OPULENT.—That portion of the mine on Little Ellen Hill not in conflict with other properties is working again.

PRINTER BOY.—This mine, situated opposite Oro City, is to be worked again. A contract has been let to put up a hoisting-engine, boilers on the property, and also a large steam-pump. Work is to be commenced in the lower shaft of the claim. The property has already produced largely, and only fell off in production when the depth precluded further operations on account of the absence of proper machinery for working the mine and handling the water.

RUBY.—So far, the mine has shipped but limited quantities of ore, all efforts having been concentrated in the attempt to more thoroughly explore and develop the mine's resources. This work is now nearly accomplished. The property will be incorporated some time in October, the company to be known as the Savannah Mining Company. Its capital will be moderate, probably not exceeding fifty thousand shares.

SILVER CORD.—Prospect-work has been started in a number of places. The extension of the main incline (No. 2) has been resumed, also the driving of the south level, in each of which machine drills are employed. As a consequence, good headway is made. The south gold incline, driven for some time past on a barren crevice, has opened a large body of medium-grade ore, through which is dispersed some fine shipping mineral. The crevice disclosing this ore-body is nearly parallel with the Gold Ore chute, and a short distance to the south. It gives indications of developing a new and profitable source of ore supply to the mine. The Gold Ore chute is holding out about the same as heretofore. The ore, to appearance, is a little lower in lead, consisting more of ocher, but may have improved in a proportionate degree in gold. The No. 3 ore-chute shows no noticeable change. The breast of the ore-chute is evidently composed of as good material as at any time in the past, while the ore-body shows no diminution in strength or size. The product for September is estimated at about 3600 tons. The work of reconstructing and repairing the plant destroyed by fire several months ago will soon be completed.

PITKIN COUNTY.

OAKLAND CONSOLIDATED.—A note, published by the Aspen *Rocky Mountain Sun* states that this company will not be responsible for any work done on the Oakland No. 2 mine, nor for any debts contracted, unless authorized by the superintendent, L. J. W. Herrick.

SPAR.—The mine is worked steadily. Ten tons of ore daily are packed to the smelter, averaging $200 per ton in silver. A 1000-foot tramway is to be built from the workings, upon which to chute the ore to the foot of the mountain to a point where it can be teamed to the smelter, when the shipments will be largely increased.

PUEBLO COUNTY.

PUEBLO OIL COMPANY.—The result of the recent meeting mentioned in our last issue has been the organization of a company with the above name, with a capital stock of $50,000. Work will be commenced at once, and if the sinking of one well does not find oil, another will be sunk.

SUMMIT COUNTY.

ROBINSON.—The Leadville *Herald* says that eight car-loads or eighty tons of ore were shipped September 22d. September 24th, the shipments amounted to only twenty-five tons. The mine, judging from what can be learned in conversation with parties familiar with its appearance, is not looking as well as might be desired.

DAKOTA.

ESTRELLA DEL NORTE.—The superintendent reports that the result of this season's work so far has turned out beyond all expectations. The force-pumps which are to convey the water to the higher bars will soon be in position ; and when they are up, the product of gold will be greatly increased.

ETTA.—Work is now in progress at this tin mine.

FATHER DE SMET.—The superintendent writes, under date of September 15th, as follows : The Golden Gate south header made its usual progress last week, the face showing as well as ever. East cross-cut, third level, continues in ore, though mixed up some with slate, but it is a good average. We are now in about 17 feet in this body, and the chances for developing a considerable amount of ore in this level seem very favorable. The rest of the mine shows about as usual, plenty of ore being in sight, the cut being very low grade in quality. I am compelled to draw for $25,000 to-day, to meet last month's expenses, which were very heavy, owing to the large bills coming in for winter supplies. I think the September account will about finish these bills up, and enable us hereafter to get along with much less expense for several months to come, every thing running along well. The report for the week ended September 22d shows : Ore extracted from first level, 700 tons ; second level, 800 tons ; third level, 485 tons. Ore milled, 1975 tons. Golden Gate east cross-cut, third level, in 62 feet ; Golden Gate, south header, second level, in 42 feet. I herewith inclose you express company's receipt for bar No. 167, containing 758 1-5 ounces gold, the result of run of mill for the first half of September. This is averaging so far a little better than the previous month. Every thing is going ahead and looking about as usual. The mill is running along smoothly and doing good work.

GRIZZLY BEAR.—The ore which is to be worked by the new stamp-mill is taken from the recent rich strike. On this streak, a tunnel has been driven eastward from the old open cut about twenty feet, and another westward sixty feet. This tunnel is about forty feet below the surface. Another ditch has been surveyed to bring water from a small branch of the gulch, in order that the whole twenty stamps may be brought into service.

STAND-BY.—Every thing will be in readiness for starting the water into the ditch early in October, and a number of the stamps will be employed upon ore from the Stand-by mine. This ore will be extracted from the old open cut and from a shaft which is now down to a depth of twenty feet. In this shaft, a streak of rich rock has been found.

IDAHO.

The Mayflower, Jay Gould, Narrow Gauge, and other mines whose ores carry 50 per cent of lead or more, are making arrangements to ship either to Omaha, Denver, Salt Lake, Melrose, or San Francisco, since the Philadelphia Smelting Company declines to buy their ore.

ALTURAS GOLD HILL.—The working force has been increased. A vein of rich ore about about three and a half feet in width has been struck and stripped for a length of 35 feet along the vein. There have been recently extracted about 200 tons of this ore that will yield an average of $100 per ton.

COLUMBIA & BEAVER.—The mill has not only been running satisfactorily, but has been doing better than was expected.

ORADO.—This company has purchased the Byron and Baltic mines, in Mineral Hill Mining District, Wood River. The mines are on the great vein or mother lode of the district, cropping out bodily from four to five feet wide, between a lime and granite formation, lime for the foot and granite for the hanging-walls. They were located in 1881.

PHILADELPHIA SMELTING COMPANY.—The order recently given regarding the purchasing of ores applies only to the ores which go very high in lead. The company will continue to buy all those that are low grade in lead.

DOUGLASS.—At the sale of this copper company's stock, delinquent under the fourth assessment of twenty-five cents per share, held at Bangor recently, nearly the entire block, comprising some 35,600 shares, was purchased by Hon. F. M. Laughton for the amount of the assessment.

MICHIGAN.

Explorations on section 10, T. 34, R. 34, have been suspended on account of "wet ground." The intention is to resume work again as soon as the weather is cold enough to freeze up the surface water accumulations.

A project is said to be on foot for the erection of a concentrating mill near Republic, at some point where the water-power can be had from the Michigamme River.

BRIER HILL.—Local papers report the stoppage of work on account of exhaustion of the ore-deposits.

EAST VULCAN.—A new shaft was started recently for the purpose of tapping the new vein.

INDIANA.—After a five weeks' idleness, work has been resumed with favorable results.

IRON HILL.—A hard blue hematite carrying nearly 60 per cent of metallic iron was taken out of the shaft sinking by this company.

NEGAUNEE CONCENTRATING COMPANY.—The mill has been closed down for the winter. The cause of this suspension is not yet known. Some reports state, however, that it has been owing to a disagreement among the stockholders.

PENN.—The company is putting down a test shaft in the hill between the Norway and Cyclops mines.

ROPES.—The mill is now running on rock taken from a new shaft, 100 feet east of the Curry where the rock milled in the first run was obtained. The management desires to prove by actual test the character of the vein at this point, and will mill 100 tons of rock mined there to that end. This shaft is down some 12 feet, the lode having a width of six feet, and the vein-matter gives promise of making a very satisfactory showing under treatment, several assays indicating that it is quite highly charged with the precious metals. Mining work is also going on in the Curry shaft, where some extremely rich rock is taken out, the free gold in it being visible to the naked eye.

MONTANA.

SILVER BOW COUNTY.

MARGARATH.—An important strike is reported in this mine, which lies immediately east of the Colusa. The shaft is sinking in vein-matter which shows a width of fifty feet at the surface. At a depth of 37 feet, an 18-inch pay-streak has been struck. The ore is black sulphurets carrying native silver, and assays from 120 to 200 ounces.

MONTANA COPPER COMPANY.—The numerous inquiries received by this company as to the amount of production of its smelting-works have induced Mr. Raunheim to state the following through the Butte *Inter-Mountain*: Owing to the recent depression of the copper market in this country, it was formerly thought not advisable to publish figures, the copper produced by this company being consumed by home brass manufactories. Since September, 1882, all the mattes produced by this company have been exported to England and contracts have been made in Europe lately for a long time to come, therefore there is no reason for withholding figures from the public. During the last twelve months, ended September 1st, 1883, the Colusa Smelting-Works shipped for export 8100 tons, averaging sixty-five per cent copper and fifty-five ounces silver per ton. Should a reduction of freight rates and fuel be granted by the rival railroads, the Montana Copper Company intends to erect an additional blast-furnace, having a daily capacity of 100 tons, thus doubling the present production.

WILLIAMS SMELTER.—The capacity of these works is to be increased by three stacks. The castings for two of them, which will be erected this fall, have already been shipped. The third stack will not be built until spring. These improvements were made as the result of the recent visit of Senator Hill and Mr. Richard Pierce, of the Argo Works, to Butte, the magnitude, permanence, and richness of whose mines deeply impressed them with the great future in store for the district. The amount of Butte ore in a crude state at the Argo Works is about 3000 tons, all of which was shipped from the Williams smelter in addition to its matte shipments.

NEVADA.

ESMERALDA COUNTY.

ENTERPRISE.—Operations have been resumed on this mine, the first westerly extension of the Mount Cory mine. This property has favorable prospects. It is intended to extend the present tunnel, which is in about 350 feet, to the ledge.

STATE LINE.—According to Nevada papers, the judgment of Tallman & Co. for $20,000 against this company has been set aside. It is stated that the company has been waiting the termination of this suit to resume work.

EUREKA COUNTY.

ALBION.—The *Sentinel* states that the mine is economically prospected, and the outlook for it is encouraging. The east rise is yielding ore in paying quantities, and some rich ore has been discovered in a rise from the June chamber. It was found about 150 feet from the A. C. line, and is making strong in Albion ground, in a northwesterly direction. The prospecting tunnel, continued from one of the flue-dust tunnels, cut a large open crevice or cave a few days ago, which goes to show that open and better ground is to be expected from now on. A farther distance of 60 feet will bring the tunnel to a point over the east upraise, where the chances for striking an ore-body have always been considered good.

ELDORADO CONSOLIDATED.—A streak of high-grade ore has been discovered in the No. 2 mine 120 feet below the level of the Eureka Tunnel and Eldorado Consolidated properties. It assays $190 per ton.

LINCOLN COUNTY.

RAYMOND & ELY.—All the machinery and company's lands and improvements at Bullionville are advertised for sale. Application may be made to J. V. Keeley, agent for Lazard Frères, San Francisco.

NYE COUNTY.

TWO G.—Work has been resumed at this mine, which has been closed down for three years. The mine has not been prospected lower than 400 feet. At this depth, water was encountered and work was stopped, and there was no machinery to handle it. On this level, the ledge was followed in a direction nearly north and south about a mile, the vein holding out along that length and going down all the while. A great deal of prospect-work has been done, generally with profitable results. The present company has had excellent success in mining and milling. It roasts and crushes the ore, instead of smelting it, as was formerly done, and works it up to 92 per cent of the pulp-assay; whereas, in the smelters, it was not worked up to more than 61 or 62 per cent. The twenty-stamp mill crushes 23 tons a day. The company is working for the present in the 300 level. It has put in a pump, and the water it uses is taken from the 400 level. It has had no occasion yet to try to drain the water-level, but believes that, when it needs to, there will be no great trouble in doing so. Since starting up the mill, it has turned out an average of about $500 very fine bullion per day. The run of the last thirty-five days was over $17,000, with two or three thousand dollars of amalgam remaining over. The present company, owing to its closer milling, can utilize a great mass of ore in the mine as well as a good deal on the dump that the former company did not succeed in working at a profit.

STOREY COUNTY—COMSTOCK LODE.

IMPERIAL.—The furnaces have been fully fired up, and the shriek of the whistle heard for the first time in nearly two years.

NEWFOUNDLAND.

A new lead and silver mine has been opened near Little Placentia, under the management of Mr. F. Ellershausen, who purchased the claim from the discoverers for £4500 sterling. Some of the richest specimens yielded, on analysis, 300 ounces of silver to the ton. It is considered a most promising mine. A large number of men are employed in working it.

BETTS COVE.—A considerable amount of ore has been extracted this year.

LITTLE BAY.—At the copper mine, nearly five hundred men are at work. The yield of the mine is in every way satisfactory.

NEW MEXICO.

GRANT COUNTY.

There are about twenty-five men employed in placer mining in Piños Altos, making a fair living. In many instances, the dirt is carried several miles to water. The arrastras are running permanently on good ore from mines in the vicinity.

BLACK PRINCE.—At the bottom of the fifty-foot shaft, 20 inches of good milling ore are found. The surface croppings plainly indicate great value.

COLUMBIA.—The shaft is 70 feet in depth, and shows from the surface to the bottom a continous and well-defined vein of ore having a milling value of $125 per ton. The vein occurs in a granite rock, and runs north of east and south of west, and is almost vertical in its dip. The mineral consists of chlorides and sulphurets of silver associated with heavy-spar and talcose matter which constitutes the gangue of the vein.

GLADSTONE.—At present, this is but a mere pit as far as developments go; but when the owners prosecute the work now contemplated, their labors will be rewarded by an abundance of fair milling ore.

OLD MAN.—The developments made show most satisfactory results. An important strike was recently made in the deep shaft.

SOCORRO COUNTY.

A number of parties are about six miles east of Socorro, working the coal-banks and marble quarries, which show well. A large bed of tripoli has been discovered; in the same neighborhood and not far distant, some excellent fire-clay has been brought to light. But few mines are developing in the Socorro Mountains; but those that are worked, notably the Alabama, Reserve, Morning Star, and others, are all looking well. The Merritt is idle on account of a disagreement with the owners of the stamp-mills.

SILVER PEG GROUP.—This is considered one of the most promising properties in the entire Magdalena range. The group comprises the Doubtful, Black Crook, Gertrude, and Commonwealth locations, and is located on the west side of the mountains, adjacent to water, of easy access for wagons and but three fourths of a mile from the smelter. It shows large quantities of galena running well in silver. The property is said to be for sale, and can be purchased for $20,000.

NEW YORK.

A correspondent of the *Evening Post* writes from Northville that the discovery of gold has caused some excitement. One of the mines is situated on the south side of a hill rising steeply from the Sacondaga, in a ledge of soft, shaly rock, easily disintegrated. There was gold there, to be sure, but it was much mixed with the sulphuret of iron, a peculiarity of most of the Adirondack ores. The second mine was on the opposite side of the hill range, and had been opened to a depth of about thirty feet, and then abandoned. At Benson Center, ten miles west, there are two mines in full operation, one worked by a local company, the other by Amsterdam (N. Y.) capitalists. The material of these mines is sand, which is worked by being reduced to powder in a "pulverizer," the gold being extracted in the ordinary way. These companies are said to be taking gold in paying quantities, although they are quite reticent about the matter.

NORTH CAROLINA.

SILVER VALLEY.—This company has ordered a concentrating plant to be connected with its twenty-stamp mill. It is stated that this is a step the company should have taken long ago, as it has been losing many valuable metals in the tailings which it now purposes saving.

PENNSYLVANIA.

Mr. John Eyerman, of Easton, sends us the following notes of interest:

FRIEDENSVILLE ZINC MINES.—All underground work at this mine has ceased. A new shaft is sinking about 150 yards from the old one. It is expected to strike the ore at a depth of about 400 feet. Galleries will be extended from the new shaft to the old workings, thus connecting the company's different mines. When the shaft is completed, the company proposes to remove the famous West engine, which has a capacity of 550 horse-power, from the old Ueberroth mine to the new shaft, thus doing away with all steam-pumps, which are hardly applicable for so great a distance on account of the condensation of the steam in the cold air. The new shaft will be 10 by 15 feet, and will probably be completed in five months. The sand collected by the old company is "buddled," and produces from 20 to 25 per cent of zinc. There are acres of this sand around the mines which was regarded by the old company as worthless. The electric lights will be introduced into the mines.

SUNBURY LEAD MINES.—On the 13th of September, a large number of persons, among whom were many stockholders, crowded the furnace-room of the Susquehanna Mining and Smelting Company, at Sunbury, to witness the first tapping of the furnace. At half-past six P.M., the furnace was charged with 3000 pounds of lead ore (galena, etc.), and tapped at forty-five minutes past nine, turning out 1600 pounds of nearly pure metal. Five to six hours is the usual smelting time. The furnace, which was built by Messrs. Holliday & Kidney, will work 3000 pounds of ore in three hours. The ore used for the first charge was washed from the fine dirt taken from the mine. The lump ore, five times richer, can not yet be handled, as the proper reducing machinery has not arrived. It is said that the ore will be concentrated to 60 per cent. The principal men in the company are Bostonians.

CORUNDUM IN LEHIGH COUNTY.—Early in the year 1882, while plowing, a farmer threw out some crystallized substance, which, upon examination, proved to be corundum. The largest crystal had a length of eight inches. Some months ago, two gentlemen from Allentown leased a plot of land adjoining the one on which the crystals had been found, and began sinking shafts on the high land, about 200 yards from the original locality. The shafts vary in depth from 30 to 5 feet. At the time of my visit on the 27th of September, five shafts were opened, and a considerable quantity of corundum taken out. The shaft farthest south seems to produce the best specimens. It is down 18 feet, and is connected by a gallery with the other shaft. As yet, no specimens large enough for working have been taken out; but it is expected that they will strike larger specimens shortly. In some of them, menaccanite, an ore of titanium and iron, is found coating the crystals as well as disseminated through them. The outlook is certainly very favorable, and it is hoped that these enterprising gentlemen may strike the vein containing large specimens.

THE IRON REGION OF NORTHAMPTON COUNTY.—All the iron mines of the Saucon Iron Company have ceased work. For some months, they have only been worked half their capacity. One of the stacks at the company's works at Hellertown is blowing out, the other one having been idle several months. It is reported that the furnaces will be sold. Many iron mines in Lehigh County have been idle for several months.

THE CHESTER COUNTY LEAD REGION.—In a recent trip through the Chester County lead region, I noticed that most of the engine-houses are falling to the ground and the machinery rusting from exposure to the dampness. If these mines were operated, what splendid railroad facilities the company would have, a branch of the Pennsylvania & Schuylkill Valley Railroad running within ten feet of the Charlestown mine and within a short distance of the others. The Pennypacker mine is filled with water to the top of the shaft. There is a considerable quantity of lead and zinc on the waste-heaps.

UTAH.

IRON COUNTY.

IRON MANUFACTURING COMPANY.—The mining claims owned by this company, recently incorporated with a capital of $200,000, with the privilege of increasing it to $2,000,000, are known as the Duncan No. 1, Blomont, Chesapeake, Excelsior, Pot Metal, and Black Magnetic, in all about 120 acres, located in the Pinto Mining District, also, the Desert Mound, in Iron Springs District, and other mining claims in this county. The principal place of business is Salt Lake City.

SUMMIT COUNTY.

BON HOMME.—This company has been incorporated with a capital stock of $300,000. The following properties belong to the corporation: The Lucky Boy, Old Observation, Protection, Park View, Springfield, Nevada, Red Boy, Bevan, Sample, Boston, Crown Point, Garden City, Davenport, Henry Clay, Alameda, and Protector, situated in Uintah Mining District.

FINANCIAL.

Gold and Silver Stocks.

NEW YORK, Friday Evening, Oct. 5.

The mining market this week has been simply a brokers' market, and the dealings, or most of them, have been confined to the fancy low-priced stocks. Of these, Eastern Oregon, Decatur, Elko, and Sonora take the lead, while Sutro Tunnel and Robinson also show very large transactions. There is no change in the price of these stocks worthy of notice. The stock of the Harlem Mining and Milling Company suffered a considerable raid, and the price was forced down to a low figure. The transactions were very heavy, the stock being the most active in the market. The total number of shares sold aggregates 183,363 shares, as against 107,890 last week.

The Comstock shares were quiet at steady prices. California was quiet and weak, selling from 15@8@14c. Consolidated Virginia was moderately dealt in and was steady, selling from 39@44c. Sierra Nevada was strong, under a small business, selling from $3.40@$4. Union Consolidated was irregular, with a small business; it sold from $4@$4.75@$4.25. Mexican was quiet and steady at $2.25@$2.50. Ophir sold at $3.25; Savage at $2; Yellow Jacket at $3.25, and Best & Belcher at $3.10. Sutro Tunnel was active and irregular, selling from 19@17@18c.

The Leadville stocks were but moderately dealt in, and were steady. Amie was quiet and a little weak, selling from 16@13c. Chrysolite was moderately dealt in, and was also a little weak; it sold from $1.25@$1.15. Dunkin sold at 25c. and Breece at 19c. Iron Silver was quiet and strong, selling from $2.90@$3.10. Leadville was also quiet at steady prices; it s old from 40@49c. Little Chief was quiet and a little weak, selling from 63@58c. Little Pittsburg sold from 64@65c., with a very small business.

The Bodie stocks were quiet and weak. Bodie Consolidated was fairly dealt in at weak prices; it sold from 58@50c. Bulwer was also weak, under a small business, selling from 57@46c. Standard was quiet and strong, selling from $5.75@$6.25. Bechtel sold at 5c.

The Tuscarora stocks were very quiet at steady prices. Grand Prize was quiet and steady at 15@22c. Belle Isle sold from 31@28c., with a small business. Navajo was quiet at $2.75. North Belle Isle was quiet and steady at 46@41@45c. Elko Consolidated was very actively dealt in and was a little weak; it sold from 9@7c.

In the miscellaneous list, Alice was strong, with a small business, selling from $2.70@2.75. Bassick sold at $9. Eureka Consolidated was quiet and steady, selling at $6.25@$6.13. Hall-Anderson was quiet at steady prices, selling from $1.15@$1.10. Horn-Silver was moderately dealt in and was steady; it sold from $7@$7.13. Northern Belle was quiet and steady, selling from $5.50@$5.75. Robinson Consolidated was fairly dealt in at irregular prices; it sold from 36@40@38c. Sierra Grande was strong, with a small business, selling from 83@$1.10.

Barcelona was quiet and irregular, selling from 36@33@34c. Caledonia sold at 35c. under a small business. Central Arizona was quiet and steady at 33@30c. Decatur was very actively dealt in at irregular prices; it sold from 3@5@4c. Eastern Oregon was also very actively dealt in and was steady; it sold from 49@47c. Harlem was very active and weak, selling from 97@70@76c. Rappahannock was irregular, with a small business, selling from 6@9@7c. Red Elephant was quiet and steady at 5@6c. Sonora Consolidated was actively dealt in at about steady prices; it sold from 28@25c.

MEETINGS.

The Findley Gold Mining Company, No. 70 Broadway, New York City. Special meeting of stockholders, October 23d, at three o'clock P.M.

The Hampshire & Baltimore Coal Company, No. 18 Broadway, New York City. Annual meeting of stockholders and election of trustees, October 18th, from twelve o'clock M. to one o'clock P.M.

The Mamie R. Gold and Silver Mining Company, Windsor Hotel, Fifth avenue and Fifty-sixth street, New York City. Annual meeting of stockholders and election of trustees, October 6th, at half-past one o'clock P.M.

The Rara Avis Gold and Silver Mining Company, Stock Exchange, Room 30, Philadelphia, Pa. Special meeting of stockholders for the purpose of increasing the capital stock from $2,000,000 to $4,000,000, November 15th.

DIVIDENDS.

The Idaho Mining Company, of California, has declared a dividend of $1 per share, payable in San Francisco.

The Leadville Consolidated Mining Company, of Colorado, has declared a dividend of five cents per share, payable October 15th, 1883. Transfer-books close October 9th and reopen October 17th.

The Plymouth Consolidated Gold Mining Company, of California, has declared a dividend of fifty cents per share, payable immediately.

The Standard Consolidated Mining Company, of California, has declared a dividend of twenty-five cents per share, payable October 12th.

The Union Coal Mining Company, of Maryland, has declared a dividend of two and a half per cent upon its capital stock, payable October 8th.

PIPE LINE CERTIFICATES.

The petroleum market this week has been very active, but prices have declined from the opening last Saturday, closing weak to-day, as will be seen by the table below.

On Monday last, the news from the oil-fields was "bullish," several wells being reported dry. The news helped the market, but a continual selling caused a gradual decline. Tuesday, the market was very active, liberal purchases being made by the "shorts." There was an advance at one time, but the market gradually weakened. Wednesday and Thursday, there were very heavy dealings, with a declining market. Reports that two new wells near the border side of the Balltown belt had come in, one dry and the other a small producer, influenced a slight rally, but the close found the market in an unsettled condition. To-day, the market declined slowly, and closed in an unsettled condition.

The following table gives the quotations and sales at the New York Mining Stock and National Petroleum Exchange:

	Opening.	Highest.	Lowest.	Closing.	Sales.
Sept. 29	$1.15⅞	$1.16¼	$1.15¼	$1.15½	1,619,000
Oct. 1	1.15⅝	1.15⅞	1.14⅝	1.14⅝	2,168,000
2	1.14⅝	1.15⅛	1.13⅝	1.14	3,772,000
3	1.13⅝	1.14⅛	1.13¼	1.13⅜	5,330,000
4	1.13⅜	1.13⅝	1.12⅝	1.13¼	3,464,000
5	1.13¾	1.13¾	1.12⅝	1.12⅞	3,140,000
Total sales					17,493,000

SAN FRANCISCO MINING STOCK QUOTATIONS.

Daily Range of Prices for the Week.

NAME OF COMPANY.	CLOSING QUOTATIONS. Sept. 28.	Sept. 29.	Oct. 1.	Oct. 2.	Oct. 3.	Oct. 4.
Albion						
Alpha	2¼		2¼	2¼	2⅜	
Alta	1⅜	1½	1½	1⅜	1¼	
Argenta						
Bechtel						
Belcher		1⅛		1⅛	1	
Belle Isle			.30	.30	.35	
Best & Belcher	3⅛	3	3⅛	3⅛	3⅛	
Bodie	.55	.60	.50	.50	.55	
Bullion						
Bulwer						
California	.15	.10	.15	.10	.10	
Challar	2⅝	2½	2⅝	2¾	2⅝	
Con. Virginia	.45	.45	.45	.40	.45	
Crown Point	1¼		1⅛		1¼	
Elko Cons	.10	.10	.15			
Eureka Cons	6¼		6¾	6½	6½	
Exchequer						
Gould & Curry	2¼	2¼	2¼	2¼	2⅜	
Grand Prize	.20	.20			.25	
Hale & Norcross	3⅝	3⅝	3⅝	3½	3¾	
Independence						
Martin White						
Mexican	2⅜	2¼	2¼	2⅛	2⅜	
Mono						
Mount Diablo						
Navajo	2¾			2⅜	2⅜	
Northern Belle	5⅞	5⅞		5¾		
North Belle Isle						
Ophir	3⅜	3¼	3½	3⅜	3½	
Overman						
Potosi	1	.90	1	.85	.95	
Savage	1¾	1½	1¼	1⅜	1½	
Scorpion	.60		.55			
Sierra Nevada	3¾	3⅜	3⅝	3½	4	
Silver King						
Tip Top						
Union Cons	4¼	3⅞	4	3⅞	4¼	
Utah	1⅞	1⅞	1⅞	1¾	2	
Wales Cons						
Yellow Jacket	3⅛	3⅛	3¼	3	3⅛	

Copper and Silver Stocks.

Reported by C. H. Smith, 15 Congress street, Boston, Stock Broker and Member of the Boston Mining and Stock Exchanges.

BOSTON, October 4.

There is but little change to note in the condition of the market for mining stocks the past week. The coppers are firm, and in a few instances a slight advance is noted, but the market continues dull and without any special indication of an increased activity in th near future. The silver stocks are as dull as ever, and it is evident that the public generally has no money or disposition to invest in new ventures with the experience of the past two or three years looking it in the face. Calumet & Hecla holds its price well at $245@$246, with but little stock changing hands. Franklin advanced from $12@$12½, with sales of a small lot at $13, and is quite firm at $12½ bid and none offered. There was a rumor that the Quincy was negotiating for the purchase of this mine, but we hear that it is officially denied. The product for September was 187 tons, against 170 last year, and there is no doubt that the mine is a paying one and can earn a dividend the present year. Quincy sold at $54@$54¼, but there was very little doing in it. The increase in the product last month was about 12 tons, being 336 tons, compared with 325 in 1882 and 317 in 1881. Osceola advanced from $18@$19 on sales of 15 shares. Pewabic declined from $3 (September 21st) to $2½. The reports from the mine are not very encouraging, the September product showing a loss of 23 tons as compared with last year. A sale of 100 shares of Ridge at 62½c. is the only transaction reported of the low-priced stocks. The reports from the Huron mine continue favorable, the September product being 57 tons, against 27 tons last year and 12 tons in September, 1881. $1½ is bid for the stock, and none offered less than $2. No sales reported.

In silver stocks, Bonanza was steady at $1¾, with sales of 500 shares only. Catalpa declined from 35c.@32½c. Crescent sold at 7½c. Harshaw at 50c. Sullivan was quite firm on limited transactions at $⅜@$1. Bowman Silver, sales at 11@13c., assessment paid. Massachusetts & New Mexico, offered at 4c. Dunkin, 25c., ex dividend. Silver Islet advanced from $2½@$3 on good news from the exploring party on the company's lands on Lake Superior. It is reported that a vein of very rich silver-bearing ore twelve inches wide and only eighteen feet below the surface has been struck, assays of which yielded an average of over 5000 ounces to the ton. Should this prove to be a veritable bonanza, the stockholders will find cause for congratulation upon the outlook and prospect of a return for the numerous assessments which they have been called upon for to keep up the enterprise.

3. P.M.—There was nothing doing at the afternoon Boards and prices unchanged. Closing prices: Bonanza, $1½ bid, $1⅞ asked. Calumet & Hecla, $245 bid, $246 asked. Franklin, $12½ bid, $13 asked. Pewabic, $2½ bid, $3 asked. Quincy, $54 asked. Silver Islet sales, $3 and bid.

BULLION MARKET.

NEW YORK, Friday Evening, Oct. 5.

DATE.	London. Pence.	N. Y. Cents.	DATE.	London. Pence.	N. Y. Cents.
Sept. 29	50 15-16	110¾	Oct. 3	50 15-16	*
Oct. 1	50 15-16	110¾	4	50 15-16	*
2	50⅝	*	5	50 15-16	110⅝

* 110½@110⅝.

Bullion Receipts at New York.—The bullion received from the mines at the various offices in this city during the week ended October 5th, as compiled from various sources, amounted to $160,000, as against $254,111, reported for the previous week. The receipts from January 1st, 1883, to date are $8,649,047.

Exports and Imports of Gold and Silver at New York.

Exports.

Week ended September 29th	$382,387
Corresponding week last year	246,844
Since January 1st, 1883	10,938,176
Corresponding period last year	44,243,595

Imports.

Week ended September 29th	$719,840
Corresponding week last year	399,532
Since January 1st, 1883	12,231,430
Corresponding period last year	3,107,468

METALS.

NEW YORK, Friday Evening, Oct. 5.

Copper.—In Lake, small parcels coming forward are taken at 15¼c., sales this week aggregating

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last.			Dividends. Total paid to date.	Dividends. Date and amount per share of last.			Highest and Lowest Prices per Share at which Sales were Made. Sept. 29. H.	Sept. 29. L.	Oct. 1. H.	Oct. 1. L.	Oct. 2. H.	Oct. 2. L.	Oct. 3. H.	Oct. 3. L.	Oct. 4. H.	Oct. 4. L.	Oct 5. H.	Oct 5. L.	Sales.	§
1	Alice, S. C.	Mont	$10,000,000	400,000	$25	*				$400,000	Dec.	1881	.10	2.70		2.70				2.70		2.75	2.70	2.75		1,300	
2	Amie Con., S. L.	Colo.	5,000,000	500,000	10	*				330,000	Oct.	1883	.05	.16		.15		.15				.15		.13		7,400	
3	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	220,000	Feb.	1883	$2.00														B.
4	Argents, S.	Nev.	10,000,000	100,000	100	275,000	Jun.	1883	.25	40,000	Feb.	1880	.20														
5	Barbee & Walker, S.	Utah	1,000,000	100,000	10	*				60,000	Nov	1880	.10														
6	Bassick, G. S.	Colo.	10,000,000	100,000	100	*				200,000	Jun.	1883	1.00									9.00				100	
7	Belle Isle, S.	Nev.	10,000,000	100,000	100	85,000	May	1883	.20	300,000	Dec.	1879	.25					.31				.30	.28			300	
8	Belcher, G. S.	Nev.	10,420,000	104,200	100	3,588,000	Apl	1883	.25	15,397,000	Apl.	1876	1.00														
9	Birdseye, G.	Cal.		15,000							Dec.	1882															S.F
10	Black Bear, G.	Cal.	3,000,000	30,000	100	15,000	Sept	1879	.50	825,000	May	1883	.20														
11	Bodie Con., G.	Cal.	10,000,000	100,000	100	225,000	Aug	1883	.50	1,225,000	Nov	1882	.20			.58		.50								3,000	S.F
12	Bonanza Developm't	C & M	3,000,000	300,000	10					135,000	Oct.	1882	.15														
13	Boston & Mont, G.	Mont	2,000,000	200,000	10	*				310,000	Jan.	1883	.05														
14	Breece, S.	Colo.	5,000,000	200,000	25	*				2,000	Feb.	1880	.01	.19				.57	.55			.55	.46			1,000	P.
15	Bulwer, G.	Cal	1,000,000	100,000	100	30,000	Dec.	1877	.50	165,000	July	1883	.15													700	
16	California, G. S.	Nev.	54,000,000	540,000	100	662,000	Sept	1883	.20	31,320,000	Dec.	1879	.50					.12				.15	.08	.14	.10	1,350	B.
17	Calumet & Hecla, C.	Mich	2,500,000	100,000	25					23,850,000	Aug.	1883	5.00														
18	Carbonate Hill, S. L.	Colo.								60,000	July	1883	.05														
19	Caribou Con., S.	Colo.	1,000,000	100,000	10	*				50,000	Mch	1880	.10														
20	Carolina Queen, C.	N. C.	200,000	100,000	2					8,000	Oct.	1882	.02														
21	Castle Creek, G.	Idah.	100,000	100,000	1					48,000	Sept	1883	.03														B.
22	Cataipa, S. L.	Colo.	3,000,000	300,000	10	*				240,000	Jun.	1883	.10														
23	Central, C.	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,670,000	Feb.	1883	3.00														
24	Christy, S.	Utah	6,000,000	60,000	100					90,000	Jan.	1883	.10														B.
25	Chrysolite, S. L.	Colo.	10,000,000	200,000	50					1,600,000	Dec.	1881	.50	1.25		1.25						1.20	1.15			1,465	
26	Con. Gold Mining, G.	Ga.	500,000	100,000	5	*				112,000	Aug.	1883	.04														S.F.
27	Con. Virginia, G. S.	Nev.	51,000,000	540,000	100	1,005,000	July	1883	.20	42,930,000	Aug.	1880	.50	.45		.44		.43		.41	.39			.44	.43	1,825	
28	Contention, S.	Ariz.	12,500,000	250,000	50					$2,461,500	Jun.	1883	.25														
29	Copper Queen, C.	Ariz.	2,500,000	250,000	10	*				1,100,000	July	1883	.50														S.F
30	Crown Point, G. S.	Nev.	10,000,000	100,000	100	2,673,000	Feb.	1882	.25	11,588,000	Jan.	1875	2.00														
31	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*				4900,000	Jan.	1883	.10														B.
32	Dunkin, S. L.	Colo.	5,000,000	200,000	25	*				210,000	Oct.	1883	.05							.25				.25		260	
33	Eureka Con., G. S. L.	Nev.	5,000,000	50,000	100	390,000	Sept	1883	.50	4,767,500	July	1882	.25			6.25	6.13									250	S.F.
34	Evening Star, S. L.	Colo.	500,000	50,000	10	*				1,275,000	Aug.	1883	.50														
35	Excelsior, G.	Cal.	10,000,000	100,000	100	360,000	Aug	1883	.60	875,000	Oct.	1880	.25														
36	Father de Smet, G.	Dak.	10,000,000	100,000	100					610,000	July	1883	.20														
37	Findley	Ga.																									
38	Franklin, C.	Mich		54,000		360,000	Jun	1877		243,000																	
39	Freeland, S.	Colo.	5,000,000	200,000	25	*				50,000	May	1880	.25														
40	Fresno Enterprise, G	Cal.	5,000,000	100,000	50		Mch	1883	.10	110,000	July	1882	.10														S.F.
41	Gem, S.	Colo	125,000	125,000	1					23,750	May	1883	.02														S.F.
42	Glass-Pendery, S. L.	Colo.	5,000,000	250,000	20	*				25,000	May	1881	.10														
43	Glen, S.	Colo.	100,000	100,000	1					7,000	May	1883	.01														
44	Gold Stripe																										
45	Gould & Curry, G. S.	Nev.	10,800,000	108,000	100	3,530,000	Jun.	1883	.50	3,826,000	Oct.	1870	10.00							.07						2,000	S.F.
46	Grand Central, S.	Ariz.	1,000,000	100,000	10					625,000	Dec.	1882	.25														
47	Grand Prize, S.	Nev.	10,000,000	100,000	100	477,000	Jun.	1883	.25	450,000	Sept	1880	.25	.15										.22		1,410	
48	Granite, S.	Colo.	125,000	125,000	1					6,250	May	1883	.01														
49	Great Eastern, G.	Dak.	3,000,000	300,000	1	*				16,000	July	1880	.01														
50	Great Western, Q.	Cal.	5,000,000	50,000	100	35,500	Aug	1873	.15	262,500	Oct.	1882	.25														
51	Green Mountain, G.	Cal.	1,250,000	125,000	10	*				212,500	Nov.	1881	.07½														
52	Hale & Norcross, G. S	Nev.	11,200,000	112,000	100	4,118,000	Sept	1883	50	1,598,000	Apl.	1871	5.00														
53	Hall-Anderson, G.	N. S.	150,000	150,000	1					7,000	Jan.	1882	.05	1.15	1.10	1.15		1.10				1.15	1.10			3,100	S.F
54	Hecla Con., S.	Mont	1,500,000	30,000	50					507,500	Oct.	1883	.50														B
55	Henriett, L.	Colo.		270,000						27,000	Feb.	1883	.10														
56	Hibernia, S. L.	Colo.	7,500,000	300,000	25	*				180,000	July	1881	.40														
57	Holyoke, G.	Idah.	200,000	200,000	1					44,000	Sept	1883	.02														
58	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	2,212,500	Sept	1883	.40					17.50		18.00						108	
59	Hope, S.	Mont	400,000	8,000	50	*				113,036	Oct.	1883	1.50														
60	Horn-Silver, S. L.	Utah	10,000,000	400,000	25	*				2,600,000	Aug.	1883	.75			7.00		7.00		7.13		7.00		7.13	7.00	1,690	
61	Howell S. & M. Co.	Ariz.	372,000	37,200	10	*				3,750	Aug.	1883	.01														
62	Hukill, G. S.	Colo.	1,000,000	200,000	5	*				210,000	Dec.	1878	.10														
63	Idaho, G.	Cal.	310,000	3,100	100					3,390,850	Oct.	1883	1.00														
64	Independence, S.	Nev.	10,000,000	100,000	100	245,000	May	1883	.30	225,000	Sept	1879	.25														B.
65	Indian Queen, S.	Nev.	250,000	125,000	2					368,750	July	1883	.03														
66	Inyo, G.	Cal.	500,000	100,000	5	*				45,000	Apl.	1882	.05														S.F
67	Iron-Silver, S. L.	Colo	10,000,000	500,000	20	*				1,200,000	Oct.	1883	.20			2.90				3.00		3.10	3.00			1,750	
68	Jocusistita, S.	Mex.	10,000,000	100,000	100					930,000	Aug.	1883	.50														
69	Kentuck	Nev.	3,000,000	30,000	100	342,000	Nov	1881	.30	1,264,000	July	1883	.10														E.
70	La Plata, S. L.	Colo.	2,000,000	200,000	10	*				610,000	Sept	1882	.30														
71	Leadville, S. L.	Colo	4,000,000	400,000	10	*				310,000	Oct.	1883	.05	.43		.45	.40			.47	.42	.49	.48			1,215	S.F.
72	Leeds, S.	Utah	6,000,000	60,000	100	87,000	July	1882	.50	78,000	Oct.	1878	.15														
73	Little Chief, S. L.	Colo	10,000,000	200,000	50	*				720,000	Oct.	1883	.10			.63				.62	.60	.60		.58		1,600	
74	Little Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*				1,050,000	Mch	1880	.50			.64		.65								300	S.F
75	Marguerite, G.	Cal.	500,000	25,000	20					18,750	Oct.	1882	.25														B.
76	Martin White, S.	Nev.	10,000,000	100,000	100	1,025,000	Sept	1883	.25	90,000	July	1879	.30									.05				325	
77	Minas Nuevas, S.	Mex.	300,000	100,000	3					20,000	July	1883	.10														
78	Morning Star, S. L.	Colo.	1,000,000	100,000	10					500,000	July	1883	.25														
79	Mt. Diablo, S.	Nev	5,000,000	50,000	100	137,500	Jun.	1880	2.00	‖ 225,000	Sept	1883	.25														
80	Napa, Q.	Cal.	700,000	7,000	100	*				250,000	Jan.	1883	.10														
81	Navajo, G. S.	Nev.	10,000,000	100,000	100	235,000	Mch	1882	.20	225,000	May	1883	.25			2.75						2.75				700	
82	New York Hill, G.	Cal.	5,000,000	50,000	100	55,000	Mch	1878	.20	215,000	Aug.	1882	.10														
83	New York & Colo., G.	Colo	1,250,000	50,000	25					25,000	July	1879	.10														B.
84	Northern Belle, S.	Nev.	5,000,000	50,000	100					2,400,000	Apl.	1883	.50	5.75		5.75						5.50		5.75		570	
85	North Bell-Isle, S.	Nev.	10,000,000	100,000	100	95,000	May	1883	.20	30,000	Aug.	1881	.15									.46		.41		800	
86	Ontario, S.	Utah	15,000,000	150,000	100					4,825,000	Jan.	1883	.50														B.
87	Ophir, G. S.	Nev.	10,000,000	100,000	100	3,645,000	Aug	1883	1.00	1,595,000	July	1882	1.00									3.25				10	
88	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	985,000	Sept	1883	50														
89	Oxford, G.	N. S.	100,000	100,000	1	*				3,000	Aug	1883	.05														S.F.
90	Pleasant Valley, G. S.	Cal.	10,000,000	100,000	100	30,000	Sept	1883	.15	30,000	Dec.	1882	.05														
91	Plymouth Con., G.	Cal.	5,000,000	100,000	50	*				250,000	Oct.	1883	.50														
92	Polonia, S.	Colo.	200,000	8,000	25					12,000		1882	1.50														
93	Prussian, S. L.	Colo	1,500,000	150,000	10					132,000	Jan.	1883	.10														
94	Quick-liver, pref., Q	Cal.	4,300,000	43,000	100					654,000	July	1882	6.00	33.50												100	P.
95	" com., Q	Cal.	5,700,000	57,000	100					151,000	July	1882	.40					6.00								100	
96	Quincy, C.	Mich	1,200,000	40,000	25	200,000	Dec.	1862	5.00	3,584,900	July	1883	3.50														S.F.
97	Renfrew, G.	N. S.	60,000	30,000	2					4,800	July	1882	.02														
98	Richmond, S. L.	Nev.	1,350,000	54,000	25	*				4,042,587	May	1883	1.25														E.
99	Rising Sun, S.	Dak.	750,000	150,000	5	*				52,000	May	1881	.07½														
100	Robinson Bar, G.	Idah.	100,000	100,000	1	*				9,000	Dec.	1882	.03														
101	Robinson Con, S. L.	Colo.	10,000,000	200,000	50					575,000	Nov	1881	.50	.40	.39	.39		.38		.38		.38		.40	.38	10,200	
102	Robert E Lee, S. L.	Colo.	250,000,000	500,000	500					100,000	Dec.	1882	.10														E.
103	San Francisco, C.	Cal.	5,000,000	50,000	100	45,000	Sept	1880	.50	20,000	Feb.	1883	.05														
104	Savage, S.	Nev.	11,200,000	112,000	100	5,540,000	July	1883	.50	4,400,000	July	1869	3.00	2.00												100	B.
105	Shoshone, G.	Idah	150,000	150,000	1					7,500	Apl.	1883	.01														
106	Sierra Buttes, G.	Cal.	225,000	22,500	10					1,435,308	Apl.	1883	.25														E.
107	Sierra Grande, S.	N. M.	10,000,000	100,000	25					700,000	Oct.	1883	.25	.90		.88	.85	.90		.98		1.05	1.00	1.10		4,500	
108	Sierra Nevada, G. S.	Nev.	10,000,000	100,000	100	5,350,000	Aug	1883	1.00	102,000	Jan.	1871	1.00	3 85		3.50		3.40				4.00				395	P.
109	S'a P'mas Eureka, G	Cal.		40,625							Apl.	1883															B.
110	Silver Coast, G. S. L.	Colo	4,500,000	450000	10					180,000	Aug	1883	.25														S.F.
111	Silver King, S.	Ariz.	1,000,000	100,000	100					1,275,000	Jun.	1883	.25			7.00										100	
112	Silver King, S.	Colo.	1,000,000	500,000	2					50,000	Aug.	1881	.10														
113	Smuggler, S. L.	Colo.	600,000	60,000	10					66,700	Aug.	1883	.25														
114	Socorro, C.	N. M.	250,000	2,500	100					4,000	Mch	1882	.00¾														B.
115	Spring Valley, G.	Cal.	200,000	200,000	1	*				50,000	Jan.	1881	.25														
116	Standard, G. S.	Cal.	10,000,000	100,000	100					4,250,000	Oct.	1883	.25	5.75		6.00	5.75			6.00		6.25				630	
117	Stormont, S.	Utah	10,000,000	200,000	1	*				155,000	Nov	1881	.05														
118	St. Joseph, L.	Mo.	1,000,000	100,000	10	*				390,000	Dec.	1882	.20														
119	Tip Top, S.	Ariz.	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov	1881	.20														
120	Tombstone, G. S.	Ariz	12,500,000	500,000	25	*				1,250,000	Apl.	1882	.10														B.
121	True Fissure, G. S. L.	Utah	1,500,000	150,000	10	*				75,000	Jun.	1883	.15														
122	United Gregory, G.	Colo.	300,000	300,000	1					38,250	Apl.	1883	.25														
123	United Gold Min. Co.	Colo.									Oct.	1883	.05														E.
124	Vizina, S.	Ariz.	5,000,000	200,000	25	*				140,000	Apl.	1882	.10														B.
125	Yellow Jacket, G. S.	Nev.	12,000,000	120,000	100	5,358,000	Feb.	1882	1.00	2,184,000	Aug.	1871	1.50													100	
126	Yuba, G.	Cal.	5,000,000	200,000	25					4,000	Sept	1881	1.00														

* Non-assessable. † The Deadwood has previously paid $275,000 in eleven dividends, and the Terra $75,000. ‡ This company, as the Western, up to December 10th, 1881, paid $1,475,000. Quotations of these stocks will be found in S. F., San Francisco; B., Boston; and P., Philadelphia, tables. E are British companies. ‖ Total number of shares, 500,000; 50,000 shares have never been issued, and are still held by the company. Dividend shares sold, 50,693.

several hundred thousand pounds. The contracts with consumers made earlier in the summer are soon ended, and the period for the purchase of new supplies is drawing near. One of the Arizona mines has contracted for the sale of six months' product, roughly five and a half millions, at 14½c., about three quarters of the quantity going abroad. Quotations for other brands than Lake range between 14¼@14¾c., according to quality, the quantity available being moderate. England cables lower to-day, quoting £62 7s. 6d. for Chili Bars. Business abroad seems depressed.

Tin.—Though quiet, this market is firm at 21c. spot for Straits and Malacca. The shipments from the Straits and from Malacca were, during Septem-

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. Number.	Par Value.	Assessments. Total levied to date.	Date and amount per share of last.			Highest and Lowest Prices per Share at which Sales were Made. Sept. 29. H.	Sept. 29. L.	Oct. 1. H.	Oct. 1. L.	Oct. 2. H.	Oct. 2. L.	Oct. 3. H.	Oct. 3. L.	Oct. 4. H.	Oct. 4. L.	Oct. 5. H.	Oct. 5. L.	Sales.	
1	Advance M & M. Co.																						
2	Albion, S. L.	Nevada	$15,000,000	150,000	$100	$625,500	July	1883	.50														S. F.
3	Alloucz, C.	Michigan	2,000,000	80,000	25	200,000	January	1883															B.
4	Alpha Con., G. S.	Nevada	3,000,000	30,000	100	420,000	March	1882	.50														S. F.
5	Alta, S.	Nevada	10,080,000	100,800	100	2,137,200	July	1883	.25														S. F.
6	Alta-Montana, G. S. L.	Montana	5,000,000	500,000	10																		
7	American Flag, S.	Colorado	1,250,000	125,000	10	300,000	June	1877	.25														
8	Barcelona, G	Nevada	5,000,000	200,000	25	*				.36	.35	..	....	.34	....	....	....	.33	....	.34	....	1,100	
9	Battle Creek																						
10	Bear Creek	California	300,000	300,000	1																		
11	Beauce																						
12	Bechtel Con., G	California	10,000,000	100,000	100	185,000	January	1883	.10									.05	....	....	....	500	S. F.
13	Best & Belcher, G. S.	Nevada	10,080,000	1 0,800	100	1,446,590	Septemb'r	1883	.50									3.10	....	....	....	200	S. F.
14	Big Pittsburg, S. L.	Colorado	20,000,000	200,000	100	*																	
15	Black Jack, G	California	250,000	100,000	2½																		
16	Bonanza Chief	Montana	1,000,000	1,000,000	1	*																	
17	Bonanza King, Cons.	California	2,000,000	200,000	10	*																	
18	Bondholder	Colorado	500,000	200,000	2½				.25														
19	Boston Con., G	California	10,000,000	100,000	100	95,000	October	1882															
20	Boulder Con	Colorado																					
21	Bradshaw, S	Arizona	2,250,000	225,000	10	*																	
22	Buckeye	Colorado	2,000,000	400,000	5	*																	
23	" preferred	Colorado																					
24	Bull Domingo, S. L.	Colorado	10,000,000	200,000	50	*																	
25	Bullion, G. S.	Nevada	10,000,000	100,000	100	3,767,000	May	1883	.20														S. F.
26	Bye and Bye	Arizona	1,000,000	100,000	10	*																	
27	Calaveras, G	California	500,000	500,000	1	*																	
28	Cal. W'r & M. Co., G.	California																					
29	Caledonia, S. H., G	Dakota	10,000,000	100,000	100	480,000	August	1882	.15	.35	....	.35										2,300	
30	Catskill, S	Nevada	1,500,000	30 ,000	5																		
31	Central Arizona, S.	Arizona	10,000,000	100,000	100					.33	.30	....										300	B.
32	Chapparal	California																					
33	Cherokee, G	California	1,500,000	150,000	10																		
34	Chollar, S	Nevada	11,200,000	112,000	100	633,000	August	1883	1.00														S. F.
35	Climax																						
36	Colorado Central, S.	Colorado	3,000,000	300,000	10																		
37	Columbia Con., G. S.	Nevada	5,000,000	100,000	50																		
38	Con. Imperial, G. S.	Nevada	50,000,000	500,000	100	1,450,000	May	1883	.05									.04	....	....	....	100	
39	Con. Pacific, G	California	6,000,000	60,000	100	156,000	March	1883	.15														
40	Crescent, S. L.	Colorado	3,000,000	300,000	10	*																	B.
41	Crowell, G	North Car.	500,000	500,000	1																		
42	Dahlonega, G	Georgia	250,000	250,000	1	*																	
43	Dardanelles, G	California	1,000,000	100,000	10																		
44	Decatur									.04	.03	.05	.03	.04	....	.04	....	.04	....	.05	.04	19,500	
45	Dunderberg, S	Colorado	1,500,000	150,000	10	*																	
46	Durango, G	Colorado	500,000	500,000	1	*																	
47	Eastern Oregon									.48	...	.49	.48	.49	.48	.49	.48	.47	....	.47	...	20,500	
48	Elko Con., S	Nevada					April	1883	.15	.09		.09	....	....	....	.09	.08	.09	.08	.07	...	12,900	
49	Empire, S	Utah	10,000,000	100,000	100																		B.
50	Enterprise	Colorado																					
51	Exchequer	Nevada	10,000,000	100,000	100	650,000	June	1883	.20														
52	Fannie Barret, S	Colorado																					
53	Globe Copper	Arizona																					
54	Gold Placer, G	Colorado	5,000,000	200,000	25	*																	
55	Goodshaw, G	California	10,000,000	100,000	100	210,000	June	1883	.10														
56	Granville, G	North Car.	300,000	300,000	1	*																	
57	Harlem M. & M. Co, G.	California														97	.85	.84	.70	.78	.74	31,200	B.
58	Harshaw, S	Arizona	10,000,000	100,000	1 40																		
59	Head Center, S	Arizona	5,000,000	200,000	25	160,000	May	1882	.20														
60	Hortense, S	Colorado	2,000,000	20 ,000	10							.09	.07									2,100	
61	Julia, G. S	Nevada	11,000,000	110,000	100	1,405,000	April	1883	.10														
62	Kossuth, G. S	Nevada	10,800,000	108,000	100	421,200	August	1877	.15														
63	Lacrosse, G	Colorado	1,000,000	100,000	10	*														.09	....	100	
64	Leviathan, S	Nevada	10,000,000	100,000	100	380,000	September	1882	.25														
65	Lucerne, S.	Colorado	5,000,000	500,000	10	*																	
66	Mariposa pref., G	California	5,000,000	50,000	100	1,687,500	December	1881															
67	" common, G	California	10,000,000	100,000	100	1,975,000	February	1883	.25														
68	May Belle, G	California	10,000,000	100,000	100	84,000	December	1881	.20														
69	Mayflower, S	Nevada	1,000,000	100,000	100	35,000	February	1883	.10														
70	Mexican, G. S	Nevada	10,000,000	100,800	100	2,420,200	Septemb'r	1883	1.00					2.50	2.25					2.50	....	340	S. F.
71	Michoacan Synd	Mexico																					
72	Miner Boy, G. S. L.	Colorado	5,000,000	500,000	10	*																	
73	Miller	Nevada	5,000,000	200,000	25																		
74	Mono, G	California	5,000,000	50,000	100	535,000	January	1883	.20														S. F.
75	Moose Silver, S	Colorado	3,000,000	300,000	10	*																	
76	Moulton, G. S	Montana	10,000,000	400,000	25	*																	
77	Nevada Syndicate																						
78	North Standard, G	California	10,000,000	100,000	100	20,000	November	1881	.10														
79	North Horn-Sil., S. L	Utah		400,000																			
80	Noonday	California	600,000	60,000	10	208,000	December	1882	1.00														S. F
81	Old Dominion, C	Arizona	3,000,000	300,000	10	*																	
82	Oriental	Nevada	2,000,000	200,000	10																		
83	Oriental & Miller, S.	Nevada	10,000,000	400,000	25							.08										100	
84	Overman, G. S	Nevada	11,520,000	115,200	100	3,604,700	May	1882	.25														S. F.
85	Parnell																						
86	Potosi	Nevada	10,200,000	112,000	100	612,640	August	1883	.50														S. F.
87	Quartz Creek				100																		
88	Rappahannock, G	Virginia		250,000		*				.08	.06	.08	....	.09	....	....	....	.07	....	....	....	6,200	
89	Red Elephant, S	Colorado	500,000	500,000	1	*				....	....	.05	....	.06	....	....	....	....	....	....	....	1,500	
90	Retort M. & M. Co	Colorado			10																		
91	San Pedro, G. S. L	New Mex.		400,000																			
92	Silver Cliff, S	Colorado	5,000,000	200,000	25	*																	B., P
93	Silver Islet	Canada	1,000,000	40,000	25																		
94	Sonora Con	Mexico								.27	....	.28	.27	.26	.25	.26	.25	.26	....	.26	.25	13,500	
95	South Bodie, G	California		100,000		100,000	March	1882	.15														
96	South Bulwer, G	California	10,000,000	100,000	100	195,000	May	1881	.25														
97	South Hite	California	10,000,000	100,000	100		January	1883	.05														
98	South Pacific	California			5																		
99	State Line, No. 1, S	Nevada	200,000	200,000	1																		B
100	" No. 2, S	Nevada	5,000,000	200,000	25																		
101	" No. 3, S	Nevada	5,000,000	200,000	25																		
102	" No. 4, S	Nevada	5,000,000	200,000	25																		
103	" Nos. 1 and 4, S	Nevada			25																		
104	" Nos. 2 and 3, S	Nevada								.06	....									.04	....	1,200	
105	Sullivan, G. S. L	Maine	500,000	100,000	5	125,000	December	1882	.25														
106	Sutro Tunnel	Nevada		2,000,000		*				.19	....	.19	....	.18	...	.19	.18	.18	.17	.18	.....	18,000	B.
107	Taylor-Plumas	California			10																		B., P
108	Tioga, G	California	10,000,000	100,000	100	285,000	October	1882	.10														
109	Tuscarora, S	Nevada	10,000,000	100,000	100	110,000	October	1881	.15														
110	Unadilla, S	Colorado	50,000,000	500,000	100																		
111	Union Con., G. S	Nevada	10,000,000	100,000	100	1,670,000	July	1883	.50	4.60	....	4.00	....	4.25	4.00	....	....	4.50	4.00	4.75	4.25	639	
112	Utah, S	Nevada	2,000,000	20,000	100	1,420,000	July	1883	1.00														S. F.
113	Vandewater	Nevada	20,000,000	200,000	100	*																	
114	Washington	Arizona	2,000,000	200,000	10																		
115	Whalen Copper	Nevada	2,500,000	100,000	25																		
116	Wide West																						
117	Willshire	California	250,000	50,000	5	*																	

G. Gold. S. Silver. L. Lead. C. Copper. * Non-assessable. † Stocks quoted on S. F. San Francisco; B., Boston; P., Philadelphia. Non-Dividend shares sold, 132,670. Total shares sold, 183,363.

ber, 710 tons to the United States and 350 tons to Great Britain, which received also 900 tons of Australian. London cables to-day £94 10s.

Lead.—During the week, sales aggregating 600 tons, exclusively ordinary and good Western, were made at 4·30@4·32½c., and one lot 4·25c. Negotiations for the sale of several thousand tons of Richmond lead have fallen through, the best bid being, we understand, 4c.

From St. Louis, Messrs. John Wahl & Co. wire us as follows to-day:

The market remains the same — if any thing, a shade weaker. The demand is very moderate, and there is very little doing on account of carnival week. Refined here is held at 4·05c. and Common at 4c.

From Chicago, Messrs. Everett & Post send the following dispatch:

Our market shows signs of weakness. Sales have been made of some four hundred tons of Common and Refined at 4·05c., 4·04c. and 4·02½c. Our market closes quiet with 4c. bid.

Spelter.—The market is quiet and dull. Ordinary Western brings 4⅜c., better grades 4½c., and such brands as Glendale, preferred for brass making, as high as 5c. Foreign is nominally 5⅛c. There is some talk in Europe of another "syndicate."

Antimony.—With a moderate trade, quotations

remain 10⅛@10¼c. for Cookson's and 9⅛c. for Hallett's.

IRON MARKET REVIEW.

New York, Friday Evening, Oct. 5.

Mr. Edward J. Shriver, Secretary of the Metal Exchange, has compiled the following statement of stocks in bond in the ports of New York, Philadelphia, Boston, Baltimore, and New Orleans on October 1st:

	Jan. 1, 1883. Tons.	Sept. 1, 1883. Tons.	Oct. 1, 1883. Tons.
Pig-iron	6,330	5,261	4,473
Spiegeleisen	4,131	1,467	1,667
Old rails	5,504	2,151	2,151
Scrap-iron	1,384	2,157	1,141
Scrap-steel	456	306	806
New iron rails	6,642	355	481
New steel rails	4,816	121	571
Grand total	29,263	11.818	12,290

American Pig.—The Metal Exchange has the following returns from five furnaces for the month of September:

Grade.	Stocks. Sept. 1.	Stocks. Oct. 1.	Production. Aug.	Production. Sept.
No. 1	9,808	9,345	5,001	6,461
No. 2	7,561	6,682	3,020	2,692
Bess., Forge, and lower grades	32,184	27,676	6,907	7,299
Grade not specified	7,750	7,171	6,606	6,717
Total	57,303	50,874	21,534	23,165

The event of the week has been the reduction in the price of Thomas No. 1 Foundry to $21 from $22, No. 2 being quoted at $20, and Gray Forge at $19. Sales in consequence of this reduction, which we presume simply follows openly the lead taken by others quietly, aggregate 500 tons. Transactions during the week have been on a very moderate scale. We quote No. 1 Foundry, $21@$22.50; No. 2, $19@$20.50, according to quality; and Gray Forge, which is easier, $18@$19.50, all at tide-water. There have been sales of round lots of Bessemer Pig at $20, and Spiegeleisen is dull at $30.12½@$30.50 for 20 per cent. Low grades are dull at $25.

At the Exchange, the following transactions were recorded:

Saturday, 100 tons pig, No. 1, spot, $19.25. Monday, 200 tons American pig, No. 1, January, $20; 100 tons Carbon, No. 1, short notice, $19.25. Tuesday, 300 tons pig, No. 1, January, $20.25. Wednesday, 100 tons Colebrook, No. 1, short notice, $19. Thursday, 100 tons American, No. 1, November, sold at $19.50; 100 tons No. 1, January, $20¼. To-day, 300 tons, No. 1, January, $20.25, and 300 tons, No. 1, February, $20.50.

Scotch Pig.—Nothing has been done, and though arrivals are light and the number of parties importing is steadily diminishing, business is limited.

We quote ex ship and to arrive: Coltness, $22.75@$23; Langloan, $23; Summerlee, $22.50@$23; Dallmellington, $20.50@$21; Eglinton, $20@$20.50; and Glengarnock, $22@$22.50.

At the Exchange, warrants to-day were 47s.

Rails.—Business is very dull, and a number of the mills have no engagements beyond the first of December. It is likely that the most unfavorably situated will have to stop temporarily, unless orders come forward more liberally, and prices are maintained at the present quotation, $37@$37.50 at mill.

Old Rails.—There is very little doing at lower figures. We quote $22.50@$23 for Ts.

Scrap.—Scrap is dull at $22 ex ship.

Philadelphia. October 5.

The break in pig-iron this week is expected to develop considerable activity in the course of the next ten days. No. 1 Thomas iron was reduced in New York to $21, and No. 2 to $19, although the company here has had no instructions to sell at those prices. It s understood that business will be done on that basis. Other companies are preparing to follow suit, and it is probable that a restriction of output will be developed in a short time, because of the impossibility of a number of the furnaces now in operation to make and sell iron at those prices. $22 is still asked and probably will be held to for some of the brands of No. 1, while No. 2 will range from $19 to $20, according to brand. The requirements are large and have been withheld, and it is now probable that they will be presented and filled for the rest of the year. Authorities in pig-iron think that the policy of cutting prices is a wise one, and that it will have a two-fold effect, first to restrict output, and secondly, to induce buyers to purchase. An upward tendency is certainly needed to stimulate trade. The business for the past week has been confined to small lots. No. 2 Foundry is plenty, and the consumption moderate. Gray Forge is unchanged, but is firm at $18 at furnace for best makes. A number of transactions took place at $17.50@$17.

Bessemer iron is without activity. A few thousand tons of Spiegeleisen have been sold at $30.25@$30.50. A great deal could be sold at $30. Muck Bars have sold from $33@$34 for ordinary makes, with $34.50@$35 asked for the best makes. Good Puddled Bars command $34, and orders for the best makes have been refused within a day or two at that figure. Some mills are sold from four to six weeks ahead, and the demand is active.

In manufactured iron, there is still a declining tendency. It is scarcely possible that that drop in foundry can affect forge, as foundry is simply equalizing itself with forge. Refined iron has weakened down to $20 in large lots, though iron has sold all along at 2·10@2·15c.; but the tendency is decidedly to the lower limit. Country mills are taking orders at this price. There is much apprehension as to Western competition, Western iron being delivered in this market at 2c., and it is said that even lower prices have been named.

There is a fairly active demand for nails, for the season, though fewer car-load lots have been sold this week than heretofore. Jobbers are not urgent about filling up, on account of the downward tendency. Quotations, $2.90@$3.

All the sheet mills are busy, stocking up for the winter's consumption, and filling current orders at card rates, 4c.@4½c.

The plate mills report fair inquiry, but less business for the past week. Prices are firm at 2·40@2·50c. for Tank, 3@3·25c. for Shell, and 4@4·25c. for Flange.

No heavy orders for structural iron have been received, but there is plenty of business in sight, which will be placed at the right time at the usual rates.

No new business has been done in steel rails. Quotations, $37@$38. Offers are made below these rates for winter deliveries.

A few thousand tons of old rails in large and small lots have been sold at $24.25 for Bridge Rails and $23.50 for Tees. Cargo Scrap is quoted at $23; Selected, $24@$25.

COAL TRADE REVIEW.

New York, Friday Evening, Oct. 5.

Anthracite.

The anthracite trade has had its sensation this week, and is to-day in a state of considerable excitement, which, so far as we can learn, is not quite warranted by the facts. It became generally known this morning that the Delaware & Hudson Company had "made a cut in prices," and pretty wild stories were afloat as to the extent and character of the reduction. Mr. Dickson, of the Delaware & Hudson Company, informs us that, owing to shortage of cars for shipment of coal Westward, the company had larger quantities of anthracite than usual coming to tide-water, and, to prevent an accumulation, had decided to offer stove and chestnut coal at a lower price to some of its clients. It is reported that the figure is $4.30 for stove, and that it has been offered to commission houses at that figure. So far as this proceeding is concerned, there is nothing startling in it, as a number of New York companies have undoubtedly done the same thing repeatedly during the past month, but they have one and all nominally held to their prices, and have in a quiet way made the best bargain they could, and well-posted buyers have been perfectly well aware of the fact. If the object of the managers of the Delaware & Hudson Company was merely to place a temporary surplus of coal, they have certainly gone at it in a manner likely to defeat their own end. The open and sudden announcement coming from such a source would simply, as it did, check all business and destroy what little confidence there was in the future of the trade. We believe that the aim of doing what was done in the manner in which it was done was to force a restriction of the output. We have ourselves repeatedly and emphatically given our opinion on the subject, but did not look forward to its realization until the close of navigation. So far as the interests of the New York companies are concerned, we are still convinced that it would have become necessary before a long time, possibly in November. So far as Philadelphia interests are concerned, it would not be necessary or advisable even till the close of navigation. The Reading Company has persistently objected to it, because it had orders on its books for its entire tonnage for weeks to come. As it controls nearly one half of the tonnage, it is, of course, the most important factor; but if confidence is to be undermined by what looks like an attempt at coercion on the part of one company on the other, a large portion of the orders on the books will melt away. We do not believe that there will be any rupture of the harmonious relations between the companies, because very few if any of them can afford to lead the way in such a course; but it does look now as though a restriction of output will have to be agreed upon a little earlier than it would have naturally come. The market could not have taken all the coal mined by full-time work for the whole of the year; and by an earlier reduction of the output, the average returns to the companies for the three coming months may be as good as though they had waited until a plethora of anthracite in the tide-water markets later on had forced them to stop. The principal duty of the managers of the companies will be to promptly arrive at an understanding on this point. It may cause a good deal of inconvenience to some of them.

Business, of course, is at a stand-still, and will be until the trade has learned to appreciate the fact that the many sensational stories afloat are not based on substantial foundation. The many buyers who have been looking for a break so patiently for many months are, of course, on the tip-toe of expectation, and the dispatches of out-of-town purchasers pouring into the offices here countermanding orders indicate their eagerness to benefit by the situation. Nothing but prompt and decisive measures will undeceive them. The majority of the trade is now carrying heavy stocks, and any fall in prices would be a serious matter. We need hardly report that as yet there has been no actual decline.

Bituminous.

Were it not for the fact that the current business is very small, the scarcity of cars in the Clearfield region, and the lack of vessels in shipping ports of Cumberland, coal would tend to improve prices. The incoming steamers are generally light in freight and carry considerable coal for their return voyages, so that the steamer trade is more than usually dull.

STATISTICS OF COAL PRODUCTION.

Belvidere-Delaware Railroad Report for the week ended September 29th:

	Week.	Year. 1883.	Year 1882.
Coal for shipment at Coal Port (Trenton)	3,235	87,615	67,727
Coal for shipment at South Amboy	9,958	562,447	618,066
Coal for distribution	21,473	608,528	529,746
Coal for company's use	3,746	118,858	95,322
Total	38,412	1,377,448	1,310,861
Increase		66,587	
Decrease			

Horsford's Acid Phosphate

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